FERMI 2 PROCEDURE - MAINTENANCE

TITLE: Mechanical Snubber Maintenance

PROCEDURE NUMBER: 35.000.075

REVISION: 3

SAFETY CLASSIFICATION: SR

INFORMATION ONLY

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The following approved Procedure Change Requests are incorporated in this revision:

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ATTACHMENTS

1.0 PURPOSE

1.1 This Procedure provides information for the disassembly, inspection, and assembly of the Pacific Scientific Mechanical Dynamic Restraints (Snubbers) Model Numbers PSA-1/4, PSA-1/2, PSA-1, PSA-3, PSA-10, PSA-35, and PSA-100.

1.2 Only those sections that apply to the intended maintenance action need be performed. Steps within those sections performed must be completed in the sequence given unless otherwise indicated.

1.3 This Procedure addresses the concerns of Reference 3.2.4 Fermi 2 Technical Specification 3/4.7.5, Snubbers.

2.0 EQUIPMENT LOCATION

"Not Applicable"

3.0 REFERENCES

3.1 Use Reference

3.1.1 Plant Operations Manual (POM) Procedure, 12.000.015, PN-12 (Work Order) Processing

3.1.2 POM Procedure, 12.000.055, In Process Material Control and Approved/Controlled Consumable Material Control

3.1.3 POM Procedure, 34.000.07, Snubber Functional Test

3.2 Source Reference

3.2.1 Nuclear Operations Policies and Programs Manuals

3.2.2 ANSI/ASME OM-4, Examination and Performance Testing of Nuclear Power Plant Dynamic Restraints (Snubbers)

3.2.3 ASME Code Section XI

3.2.4 Fermi-2 Technical Specification 3/4.7.5, Snubbers

3.2.5 POM Procedure, 31.000.02, Maintenance Record System

3.2.6 POM Procedure, 31.000.04, Control of Calibrated Maintenance Equipment

3.2.7 POM Procedure, 32.000.12, Requirements for Operation of Cranes, Hoists, and Lifting Devices

3.2.8 POM Procedure, 12.000.013, Radiation Work Permit

3.2.9 LUBE-001, EF-2 Lubrication Manual

3.2.10 EF-2 Approved/Controlled Materials Manual

3.2.11 Wyle Laboratories Model 100 Snubber Test Machine Serial No. 101 Operating Manual

3.2.12 EF-2 Hanger Control System Summary Report, EFHR 100

3.2.13 Pacific Scientific Repair and Overhaul Manual for Model PSA-1/4 and PSA-1/2 Mechanical Shock Arrestors

3.2.14 Pacific Scientific Repair and Overhaul Manual for Model PSA-1, PSA-3, and PSA-10 Mechanical Shock Arrestors

3.2.15 Pacific Scientific Repair and Overhaul Manual for PSA-35 and PSA-100 Mechanical Shock Arrestors

3.2.16 Pacific Scientific Installation and Maintenance of Mechanical Shock Arrestors, B21-01-000-SG-007

4.0 PLANNING INFORMATION

4.1 General

4.1.1 Manpower and equipment not listed should be specified in the Work Order Package.

4.2 Measuring and Test Equipment

4.2.1 Measuring and test equipment (M&TE) used in the performance of this maintenance task shall be documented on Attachment 1, 2 or 3 as applicable.

4.3 Consumable Materials

4.3.1 Any consumable material which is to be used in lieu of an item specified in this section shall be authorized for use by Nuclear Engineering and documented in the Remarks section of Attachment 1, 2 or 3 as applicable.

4.3.2 The following consumable material shall be used in the performance of this procedure.

1. Chevron NRRG 159 Lubricant.
2. Loctite Retaining Compound RC60.
3. Cobehn solvent or the equivalent
4. Lint free cloths
5. Fel-Pro N-5000
6. Solvent P-D-680

4.4 Special Tools and Equipment

1. Refer to Enclosure 4 for List of Special Tools and fixtures.

5.0 PRECAUTIONS AND LIMITATIONS

5.1 Establish a boundary around the work area. Housekeeping and cleanliness requirements of Reference 3.1.3 POM Procedure, 12.000.048, "Plant Housekeeping" shall be observed.

5.2 Establish a designated storage area for parts removed during disassembly and tag parts removed to ensure proper identification and reinstallation. If QA Level 1 or ASME Equipment, store and tag parts in accordance with Reference 3.1.2 POM Procedure, 12.000.055, "In Process Material Control and Approved/Controlled Consumable Material Control." Record storage location in the Remarks Section of the applicable attachment.

5.3 Materials will be used and controlled in accordance with Reference 3.1.2 in the performance of this procedure.

5.4 The following exclusive materials shall be used in the performance of this procedure. No substitutes may be accepted.

5.4.1 Chevron NRRG 159 Lubricant.

5.4.2 Loctite Retaining Compound RC40.

5.5 Special tools and holding fixtures supplied by Pacific Scientific or equivalents are needed to overhaul snubbers. Refer to Enclosure 4 for a list of special tools and holding fixtures.

5.6 Only those persons who have completed the Wyle 100 Snubber Test Machine training or who have received equivalent training will operate the Snubber Test Machine.

5.7 Only those persons who have completed the Pacific Scientific Snubber Overhaul Training or have received equivalent training will overhaul and/or repair Pacific Scientific Snubbers.

5.8 Disassembly of Pacific Scientific Snubbers is limited to those parts and assemblies listed in the enclosures. Prior to disassembly, read the applicable enclosure to determine extent of disassembly. Each assembly listed in the enclosures is a critical item requiring special techniques and tooling for repair and overhaul. Parts for these assemblies are not procurable.

6.0 PREREQUISITES

6.1 The Nuclear Shift Supervisor has been notified concerning the maintenance activity that will be performed and the subject equipment has been released for this maintenance procedure in accordance with Reference 3.1.1, POM Procedure 12.000.015, PN-21 [Work Order] Processing.

6.2 The Snubber has been removed in accordance with Reference 3.1.3, POM Procedure 34.000.07, "Snubber Functional Test" and has been transported to the disassembly area.

6.3 Enter Snubber Serial Number and Model Number in the applicable attachment of this procedure.

6.4 The Work Leader assigned the responsibility for performing this procedure has reviewed the work plan and understands the total job. He shall sign the Maintenance Data Sheet's "Prerequisites Met" slot (Attachment 1, 2, or 3) to document this understanding and that all other prerequisites have been met.

7.0 PROCEDURE

NOTE (1): ANSI/ASME OM-4 requires that an Inservice Examination Failure Evaluation be performed, and the failed snubbers be grouped by the failure modes of generic, application induced, isolated, or unexplained see Reference 3.2.2, ANSI/ASME OM-4, Examination and Performance Testing of Nuclear Power Plant Dynamic Restraints (Snubbers) for definitions of modes.

NOTE (2): Conditions discovered during the overhaul/repair of a snubber, not noted elsewhere in the applicable attachment, that will aid in this evaluation should be noted in the Remarks Section of the applicable attachment.

7.1 Overhaul of Models PSA-1/4 and PSA-1/2

NOTE: Refer to Enclosure 1 for component identification and Enclosure 4 for special tools and fixtures.

7.1.1 Disassembly

1. Match-mark and remove the transition tube or rear bracket assembly as applicable.

   NOTE: Disassembly is limited to removal of those parts and assemblies listed in enclosure 1 parts list. Prior to attempting disassembly of arrestor, read enclosure 1 to determine extent of disassembly permitted.

CAUTION
Do not disassemble housing and insert assembly (4), rod and bearing assembly (19), or torque carrier and assembly (14); detail parts for these assemblies are not procurable. Each assembly is a critical item requiring special techniques and tooling for repair and overhaul.

2. Match-mark the housing and install assembly (4) to the inner tube (25) (insure match-marks will be visible with the outer tube installed).

3. Using Truarc pliers, No. 03, remove and discard retaining ring (1) to free outer tube (2) from rod and bearing assembly (19).

4. Using Truarc Pliers, No. 05 remove retaining ring (3) to free housing and inertia mass assembly (8) from inner tube (25). Discard retaining ring.

5. Remove and discard ball (5) from housing and insert assembly (4).

6. Remove washers (6, 7) from shaft of torque carrier and shaft assembly (14).

7. For future reference record thickness of washers (7) used to determine quantity to install at reassembly. Discard washers.

8. Remove inertia mass (8) from shaft of torque carrier and shaft assembly (14). Remove and discard clutch spring (12) from inertia mass.

9. Remove and discard flat washer (13) from shaft of torque carrier and shaft assembly (14).

10. Unscrew torque carrier and shaft assembly (14) from rod and bearing assembly (19).

11. Remove and discard keeper rings (9) and capstan spring (10) from torque carrier and shaft assembly (14).

12. Remove and discard retaining ring (18) to free support washer (16) from inner tube (25).

13. Remove retaining ring (1) with a probe placed in one of retaining ring holes, to free guide plate (24) and anti-rotation key (17).

14. Discard retaining ring and anti-rotation key.

15. Extend rod and bearing assembly (19) fully to slide out of inner tube (25).

16. Using pivot bearing driver, No. 1801104-AT-2-2, and jam nut adaptor, No. 1801104-AT-2-1, loosen jam nut (20) and pivot bearing (22).

17. Hold pivot bearing in place and loosen jam nut.

18. Remove and discard jam nut lockwasher (21), pivot bearing, and ball (23).

19. Remove guide plate (24) from rod and bearing assembly (19).

7.1.2 Cleaning

CAUTION
SOLVENT P-D-680 OR APPROVED EQUIVALENT IS TOXIC AND FLAMMABLE. AVOID PROLONGED CONTACT WITH SKIN AND KEEP AWAY FROM OPEN FLAME. USE ONLY IN A WELL-VENTILATED AREA.

CAUTION
EYE PROTECTION SHOULD BE WORN WHEN COMPRESSED AIR IS USED TO DRY PARTS.

CAUTION
DO NOT IMMERSE TORQUE CARRIER AND SHAFT ASSEMBLY (14) OR ROD AND BEARING ASSEMBLY (19) IN SOLVENT. LEAKAGE OF SOLVENT INTO INTERIOR OF TORQUE CARRIER AND SHAFT ASSEMBLY WILL REMOVE LUBRICANT FROM INTERNAL PARTS WHICH CANNOT BE RELUBRICATED.

1. Wash all disassembled parts, except torque carrier and shaft assembly (14), and rod and bearing assembly (19), in solvent, using a non-metallic brush to loosen caked sediment and other foreign material.

2. Wipe external surfaces and torque carrier of torque carrier and shaft assembly (14) and rod and bearing assembly (19) with a clean lint-free cloth moistened with solvent.

3. Dry all parts using a clean lint-free cloth and/or filtered, dry compressed air at 20 psig maximum.

7.1.3 Inspection

NOTE (1): Insure parts are free of rust, corrosion, dirt, grease, oil, and other contamination.

NOTE (2): Replace any part that cannot be reworked to meet inspection requirements. If defective part is repairable, note defect in remarks section.

NOTE (3): Brinell marks are allowed at edges of the torque carrier and shaft assembly (14) that contact tangs of capstan spring (10).

1. Complete the following general inspection as follows:

   a. Visually check that all parts are clean and free from corrosion and deterioration.

   b. Check security of all parts not removed during disassembly.

   c. Visually check all threaded parts for crossed or damaged threads. Reject parts if thread damage exceeds 50 percent of one thread. If damage to any one thread is 50 percent or less, note defects in Remarks section of Attachment 1.

   d. Check finishes of all metal parts for damaged or worn-through areas. Note any defects in Remarks section of Attachment 1.

   e. Check all parts for burrs, nicks, scratches, cracks, or structural damage.

2. Perform the following detail inspection. Refer to Sheet 3 of Enclosure 1 for locations of detail parts and assemblies listed. Document results on Attachment 1.

NOMENCLATURE AND INDEX NO. (SEE ENCLOSURE 1) PAGE 3	TYPE OF INSPECTION	CHECK	ACCEPTANCE CRITERIA
a. Outer Tube (2)	Visual	Evidence of deformation which may cause bore to bind on inner tube during operation.	Bore of outer tube shall be round and not interfere with outside diameter of inner tube
b. Torque Carrier Shaft Assembly (14)	Visual	Check condition of ball socket at each end of shaft, condition of external threads.	Ball socket and must not show evidence of damage or be deformed. No thread form damage allowed.
	Dimensional	Using torque carrier and shaft assembly runout test fixture (P/N 1801104CF1), check runout on shaft.	Runout shall not exceed 0.005 in.
c. Rod and Bearing Assembly (19)	Visual	Check spherical bearing for freedom of rotation and security of installation.	Bearing shall rotate smoothly without binding.
	Visual	Check condition of internal threads and for wear or galling on bearing surfaces.	No evidence of wear allowed.
	Dimensional	Using helical cam bearing concentricity fixture (P/N 1801533-CF-1), check helical cam bearing for concentricity to plug seat.	Shall be concentric within 0.005 inch.
d. Inner Tube Assembly (25)	Visual	Evidence of deformation which may cause surface to bind on outer tube during operation.	Surface of inner tube shall be round and not to interfere with inside diameter of outer tube.

NOMENCLATURE AND INDEX NO. (SEE ENCLOSURE 1) PAGE 3	TYPE OF INSPECTION	CHECK	ACCEPTANCE CRITERIA
	Visual	Check for wear on surface mating with capstan spring.	No evidence of wear allowed.
e. Nameplate (27)	Visual	After reassembly and test, check nameplate for security of attachment.	Nameplate shall be securely attached by drive screws.

7.1.4 Parts and Assembly replacement

NOTE (1): The following paragraphs provide general replacement instructions for the arrestor:

NOTE (2): Brinell marks allowed at the edges of the carrier on the torque carrier and shaft assembly (14) that contact tangs of capstan spring (10).

NOTE (3): Replace torque carrier and shaft assembly (14), or rod and bearing assembly (19), as an assembly if any part is defective. Detail parts of these assemblies are not procurable separately.

1. Replace the following at each overhaul, regardless of condition.

   a. Retaining rings (1, 3, 15, and 18)

   b. Flat washers (6, 7, and 13)

   c. Support washer (16)

   d. Lock washer (21)

   e. Clutch spring (12)

   f. Keeper rings (9)

   g. Capstan spring (10)

   h. Balls (5, 23)

i. Anti-rotation key (17)

j. Pivot bearing (22)

k. Jam nut (20)

2. Replace parts where damage prevents complete and proper mating of parts and sealing surfaces.

3. Replace any damaged threaded parts.

7.1.5 Assembly

1. Lubricate parts as follows:

CAUTION
USE LUBRICANT SPECIFIED IN SECTION 5.4.1 ONLY. NO SUBSTITUTE IS APPROVED FOR USE IN THE ARRESTOR.

a. Using bearing, P/N 1801533-01, apply a light film of lubricant to shaft of leadscrew; then wipe off with lint-free cloth.

b. Using a clean, lint-free cloth dampened with Item 4.3.2.3, wipe chromed surface of capstan of inner tube (25) clean of all oil or grease.

c. Coat entire chromed surface with a light film of lubricant; then, wipe with a clean, dry, lint-free cloth.

2. Using needle nose pliers,

a. Install one new keeper ring (9) in bottom slot in bore of torque carrier and shaft assembly (14).

b. Install new capstan spring (10) and second new keeper ring (9).

c. Verify proper seating of keeper rings and capstan spring.

3. Install new clutch spring (12) in bore of inertia mass (8). Make certain that clutch spring is centered in groove in inertia mass.

4. Install new ball (5) into small bore of housing and insert assembly (4).

5. Install new support washer (16) into groove in inner tube (25), and install new retaining ring (15) securing washer in place.

6. Insert outer tube (2) onto inner tube (25).

7. Install guide plate (24), with code number towards plug end, onto rods of rod and bearing assembly (19).

8. Install rod and bearing assembly and guide plate into inner tube (25).

9. Retain rod and bearing assembly in extended position and push guide plate down inside diameter of inner tube past groove for retaining ring (1).

10. Using Truarc pliers, install new retaining ring below top of inner tube.

11. Use another guide plate to push retaining ring down to seat in groove. Verify proper seating of ring.

12. Fully extend rod and bearing assembly (19), then use a probe placed in a hole of the retaining ring (1) to turn retaining ring until hole for anti-rotation key (17) in inner tube (25) is visible between tangs of retaining ring.

13. Install new anti-rotation key (17) using Magnet Tool, Part No. 1801104-MIT-2, to align and place key in hole of inner tube (25).

    a. Pull rod and bearing assembly (19) so that key is aligned with slot in guide plate (24).

14. Maintain rod and bearing assembly in a fully extended position to prevent key from falling out of inner tube (25).

15. Install torque carrier and shaft assembly (14) into rod and bearing assembly (19).

16. Thread torque carrier and shaft assembly into rod and bearing assembly until movement is felt at plug end.

17. Install new flat washer (13) on shaft of torque carrier and shaft assembly.

18. Install inertia mass (8) on shaft of torque carrier and shaft assembly (14) making sure that capstan spring (10) tangs are aligned between lips of clutch spring (12) in inertia mass.

19. Check inertia mass for freedom of movement and verify that rotational movement is 20 degrees maximum.

20. Install new flat washers (6 and 7) the same thicknesses as old flat washers (13) as removed in disassembly.

    a. If exact thickness of washers are not known, install two washers (6), one washer (7), and proceed to next step.

21. Taking care not to lose washers (6 and 7) or ball (5), install housing and insert assembly (4).

22. Using Truarc pliers, install new retaining ring (3) securing housing and insert assembly (4) in place.

23. Shake back and forth lengthwise and listen for a rattle indicating inertia mass has a slight lateral movement.

24. If no movement is detected, remove one washer (7) and test again. Continue this process until a slight movement of the inertia mass is detected.

    NOTE: Washers (7) are 0.010 inch thick, therefore final inertia mass movement will be between 0.001 and 0.009 inch when proper installation is achieved. Housing and insert assembly may rotate, but may not move up and down.

25. If excessive rattle, and thus excessive lateral movement of the inertia mass is detected, install additional washers (7) until no movement is noticed, then remove one washer (7).

26. Thread new pivot bearing (22) fully into guide plate (24) and back out to insure threads do not bind in guide plate.

    a. If any hesitation or binding is noticed, discard both parts and replace with new parts.

27. Install new ball (23) and pivot bearing (22) in bore of guide plate (24).

28. Install new lock washer (21) and jam nut (20) on pivot bearing.

29. Tighten Pivot bearing (22) using pivot bearing driver, Part No. 1801104-AT-2-2 and jam nut adaptor, Part No. 1801104-AT-2-1; then back off approximately 60 to 90 degrees.

30. Holding pivot bearing (22) in place:

    a. Torque jam nut (20) to 25 inch pounds (24 - 26 in. lbs.); using jam nut adaptor and torque wrench No 6003. Document on Attachment 1.

31. Move outer tube (2) over shoulder of end plug. Using Truarc Pliers, install new retaining ring (1) into groove on inside diameter of outer tube (2).

32. Slowly extend and retract rod and bearing assembly (19) several times and verify there is no detectable binding or hesitation throughout the full stroke operation.

33. Adjust the housing and insert assembly (4) to the inner tube (25).

    a. Lightly clamp the snubber in a soft jawed vice in a vertical position with the telescoping end (rear bracket) up.

CAUTION
Do not relax the downward pressure and do not remove the retaining ring. Only relieve the grip enough to allow for free rotation of the lug.

    b. Using the Truarc pliers relax the grip of the retaining ring (3). Do not relieve the retaining ring.

    c. While lightly pressing down on the paddle lug, turn the telescoping end to align the match marks then allow the retaining ring (7) to seat solidly.

d. Remove the snubber from the vice.

e. Slowly stroke the snubber to check for binding.

NOTE: If snubber is to be functionally tested with the extension tube removed, do not install the extension tube until after functional testing.

34. Install the rear bracket or extension tube as follows:

a. Align match-marks made during disassembly in (Step 7.1.1.1).

b. Lubricate the bolts with Item 4.3.2.4.

c. Torque bolts to 22 inch pounds (20 - 24 in. lbs.) Document on Attachment 1.

d. Lockwire with .040 inch diameter stainless steel lockwire.

e. Slowly stroke the snubber to ensure no binding.

7.1.6 Document the completion of Section 7.1 on Attachment 1.

7.2 Overhaul of Models PSA-1, PSA-3, and PSA-10

NOTE: Refer to Enclosure 2 for component identification and Enclosure 4 for special tools and fixtures.

7.2.1 Disassembly

NOTE: Disassembly is limited to removal of those parts and assemblies listed in Enclosure 2 parts list.

CAUTION
Do not disassemble end plug assembly (25), or support cylinder assembly (33); detail parts for these assemblies are not procurable. Each assembly is a critical item requiring special techniques and tooling for repair and overhaul.

1. Match-mark and remove the transition tube or rear bracket as applicable.

2. Remove retaining ring (1) and dust cover (2) from housing (7). Discard retaining ring.

CAUTION
WHEN PERFORMING FOLLOWING STEP 7.2.1.3, USE CARE TO AVOID SHEARING HEADS FROM FILISTER HEAD SCREWS (3). IF SUCH OCCURS, END PLUG ASSEMBLY (21) MUST BE REPLACED.

NOTE (1): Threads of filister head screws (3) are coated on installation with Item 4.3.2.2 Loctite Retaining Compound to prevent loosening.

NOTE (2): To remove screws, it may be necessary to use a screwdriver and an adjustable wrench to develop sufficient torque to rotate screws. Attach adjustable wrench to shank of screwdriver, not to handle.

3. Remove and discard filister head screws (3) and flat washers (13) to free position indicator tube (5) from end plug assembly (25).

4. Slide off position indicator tube (5).

5. Match-mark the housing (7) to the support cylinder assembly (33) (insure the match mark will be visible with the outer tube installed).

6. Using heavy duty truarc pliers, remove and discard retaining ring (6) to free housing (7) from support cylinder assembly (33).

CAUTION
INSTALL ARRESTOR IN HOLDING FIXTURE WITH FIXTURE CLAMPED AROUND SUPPORT CYLINDER ASSEMBLY (33), NOT AROUND TELESCOPING CYLINDER. CLAMPING FORCE MAY PERMANENTLY DEFORM TELESCOPING CYLINDER.

7. Install and clamp arrestor horizontally in appropriate holding fixture.

8. Using Truarc Pliers, Part No. RE-0150, remove retaining ring (8) from ball screw shaft.

   a. Slide off flat washers (9, 10, and 13) and inertia mass (11).

b. Discard retaining ring and flat washers.

9. Remove clutch spring (12) from bore of inertia mass (11).

10. Using Truarc Pliers, Part No. RE-0150, remove retaining ring (14) from shaft of leadscrew.

a. Slide off flat washers (13 and 15) and torque drum (16).

b. Discard retaining ring and flat washers.

NOTE: If machine key (28) comes off with torque drum (16), reinsert into slot in the inner race (29) and key way in shaft of ball bearing screw assembly (27).

11. Using needle nose pliers, remove one keeper ring (17) to free capstan spring (18) from bore of torque drum (16).

a. Remove capstan spring and second keeper ring (19).

b. Discard capstan spring and keeper rings.

CAUTION
DO NOT REMOVE SETSCREWS (24), UNLESS IT IS NECESSARY TO REMOVE END PLUG ASSEMBLY (25) FOR REPLACEMENT. IF NECESSARY, USE A DRILL WITH DRILL SIZE NO. 30 FOR PSA-1 AND NO. 23 FOR PSA-3 AND PSA-10, TO REMOVE DISTORTION ON THREADS OF TELESCOPING CYLINDER, CAUSED BY SETSCREW. DRILL ONLY TO DEPTH NECESSARY TO REMOVE DISTORTION SO THAT END PLUG ASSEMBLY CAN ROTATE FREELY. USE EYE PROTECTION, AND REMOVE ANY LOOSE DRILL SHAVINGS WITH CLEAN COMPRESSED AIR.

12. Using Allen Wrench, remove and discard setscrews (24) form support cylinder assembly (33).

13. Remove end plug assembly as follows;

a. Install arrestor in holding fixture, Part No. 1801103AT4.

b. Install appropriate torque wrench adapter on end plug assembly (25).

c. Using breaker bar as a lever, rotate end plug assembly counterclockwise to loosen.

d. Remove breaker bar and torque wrench adapter.

CAUTION
IF TELESCOPING CYLINDER ROTATES WHEN END PLUG ASSEMBLY (25) ROTATES COUNTERCLOCKWISE, INTERNAL DAMAGE HAS OCCURRED. (BALLSCREW ASSEMBLY HAS BECOME UNSTAKED). SUPPORT CYLINDER ASSEMBLY (33) MUST BE REPLACED, AND DEFECTIVE SUPPORT CYLINDER ASSEMBLY RETURNED TO PACIFIC SCIENTIFIC FOR REPAIR.

e. Unscrew and remove end plug assembly (25) from telescoping cylinder of support cylinder assembly (33).

7.2.2 Cleaning

CAUTION
SOLVENT P-D-680 OR APPROVED EQUIVALENT IS TOXIC AND FLAMMABLE. AVOID PROLONGED CONTACT WITH SKIN AND KEEP AWAY FROM OPEN FLAME. USE ONLY IN A WELL-VENTILATED AREA.

CAUTION
EYE PROTECTION SHOULD BE WORN WHEN COMPRESSED AIR IS USED TO DRY PARTS.

CAUTION
DO NOT IMMERSE SUPPORT CYLINDER ASSEMBLY (33) IN SOLVENT. LEAKAGE OF SOLVENT INTO INTERIOR OF SUPPORT CYLINDER ASSEMBLY WILL REMOVE LUBRICANT FROM INTERNAL PARTS WHICH CANNOT BE RELUBRICATED.

1. Wash all disassembled parts, except support cylinder assembly (33), in solvent, using a non-metallic brush to loosen caked sediment and other foreign material.

2. Wipe external surfaces of support cylinder assembly (33) with a clean lint-free cloth moistened with solvent.

3. Dry all parts using a clean lint-free cloth and/or clean compressed air at 20 psig maximum.

7.2.3 Inspection

NOTE (1): Parts must be free of rust, corrosion, dirt, grease, oil, and other contamination.

NOTE (2): Replace any part that cannot be repaired or reworked to meet inspection requirements.

NOTE (3): If defective part is repairable, note defect in Remarks Section and assign part for repair.

1. Complete the following general inspection:

NOTE: Brinell marks are allowable at edges of torque drum (16) that contact tangs of capstan spring (18).

a. Visually check that all parts are clean and free from corrosion and deterioration.

b. Check security of all parts not removed during disassembly.

c. Visually check all threaded parts for crossed or damaged threads. Reject parts if thread damage exceeds 50 percent of one thread. If damage to any one thread is 50 percent or less, document defects in Remarks section of Attachment 2.

d. Check finishes of all metal parts for damaged or worn-through areas. Document any defects in the Remarks section of Attachment 2.

e. Check all parts for burrs, nicks, scratches, cracks, or structural damage.

2. Perform the following detail inspection. Refer to Sheet 5 of Enclosure 2 for locations of detail parts and assemblies listed. Document results on Attachment 2.

	NOMENCLATURE AND INDEX NO. (SHEET 5 OF ENCLOSURE 2)	TYPE OF INSPECTION	CHECK	ACCEPTANCE CRITERIA
a.	Position Indicator Tube (5)	Visual	Evidence of deformation which may cause bore to bind on support cylinder during operation.	Bore of position indicator tube shall be round and not interfere with outside diameter of support cylinder.
b.	End Plug Assembly (25)	Visual	Check bearing for freedom of rotation and security of installation.	Bearing shall rotate smoothly without binding. Bearing shall securely installed.
c.	Support Assembly (3)	Operational	Extend and retract telescoping cylinder through several complete	Telescoping cylinder shall extend and cycles. retract through full stroke without hesitation or binding.
d.	Nameplate (35)	Visual	Check nameplate for security of attachment.	Nameplate shall be securely attached by drive screws (34).

7.2.4 Parts and assembly replacement

1. Replace all parts or assemblies that are damaged or worn.

   NOTE (1): Brinell marks are allowable at edges of torque drum (16) that contact tangs of capstan spring (18).

   NOTE (2): Replace end plug assembly (25), or support cylinder assembly (33), as an assembly if any part is defective. Detail parts of these assemblies are not procurable separately.

2. Replace the following at each overhaul, regardless of condition.

   a. Retaining rings (6, 1, and 8)

   b. Flat washers (9, 10, 13, and 15)

   c. Clutch spring (12)

   d. Keeper rings (17 and 19)

   e. Capstan spring (18)

   f. Filister head screws (3)

   g. Setscrews (24)

3. Replace parts where damage prevents complete and proper mating of parts and sealing surfaces.

   NOTE: Do not "chase" threads of screw type fasteners.

4. Chase all damaged threads (if damage to one thread is 50 percent or less) using the appropriate tap or die.

7.2.5 Assembly

1. Lubricate parts as follows:

CAUTION
Use lubricant specified in Section 5.4.1 only. No substitute is approved for use in the arrestor.

a. Using a soft-bristle brush, apply a light film of lubricant to entire ball screw shaft.

b. Using a soft-bristle brush, apply a light film of lubricant to external threads of telescoping cylinder (26).

c. Using a clean, lint-free cloth dampened with Cobehn solvent, wipe chromed surface of capstan spring (18) clean of all oil or grease.

d. Coat entire chromed surface of capstan spring (18) with a light film of lubricant; then, wipe with a clean, dry, lint-free cloth.

NOTE: Clamp holding fixture around support cylinder, not around telescoping cylinder.

2. Install and clamp support cylinder assembly (33) horizontally in appropriate holding fixture.

3. Using a clean, lint-free cloth dampened with Cobehn solvent, wipe capstan spring diameter of support cylinder assembly (33) clean of all oil or grease.

4. Coat entire chromed surface of support cylinder assembly (33) with a light film of lubricant; then wipe with a clean, dry lint-free cloth.

5. Using needle nose pliers:

a. Install one new keeper ring (19) in bottom slot in bore of torque drum (16).

b. Install new capstan spring (18) and second new keeper ring (17).

6. Slide torque drum (16), with assembled parts (19 and 18), on capstan of support cylinder assembly (33).

NOTE: Torque drum (16) endplay should be 0.000 to 0.031 inch. If necessary, alter quantity of washers (13 and 15) to obtain proper endplay.

7. Using Truarc Pliers, Part No. 02, install new flat washers (13 and 15), and retaining ring (14) to secure parts to shaft of ball bearing screw assembly (27).

8. Manually extend and retract telescoping cylinder while observing torque drum (16) for freedom of rotation.

9. Install new clutch spring (12) in bore of inertia mass (11). Make certain that lips of clutch spring are centered on slot in inertia mass.

10. Install new flat washer (13) on shaft of ball screw.

11. Install inertia mass (11) in accordance with the following instructions.

CAUTION
WHEN INSTALLED, BOTH TANGS OF CAPSTAN SPRING (18) MUST BE LOCATED IN SLOT INERTIA MASS, BETWEEN CLUTCH SPRING LIPS. SINCE INSTALLATION OF INERTIA MASS IS A BLIND PROCEDURE, PAY STRICT ATTENTION TO THE FOLLOWING INSTRUCTIONS TO VERIFY PROPER INSTALLATION. IMPROPER INSTALLATION OF INERTIA MASS WILL CAUSE IMPROPER BRAKING ACTION OF THE ARRESTOR DURING OPERATION.

a. Rotate torque drum (16) until both tangs of capstan spring (18) are in the uppermost position.

b. Visually align slot in inertia mass (11) so that tangs of capstan spring (18) are centered between lips of clutch spring (12) in inertia mass.

c. With shaft of ball screw centered in hub of inertia mass (11), and tangs of capstan spring (18) visually centered between lips of clutch spring, carefully slide inertia mass straight in until bottomed.

d. Ensure that tangs of capstan spring (18) are properly centered as follows:

1) Rotate inertia mass (11) quickly clockwise and counterclockwise on shaft of leadscrew.

NOTE (1): If capstan spring (18) tangs are properly centered, the interval between pings will be relatively short, the audible sound will be faint, and the rotational travel between pings will be limited to a few degrees (approximately 5°).

NOTE (2): If capstan spring (18) tangs are improperly centered (only one tang, or neither, between clutch spring lips) the interval between pings will be several times longer, the audible sound will be louder, and the rotational travel between pings will be many degrees greater (approximately 30°).

2) While maintaining a relatively constant rotational speed, listen for an audible "ping" as the capstan spring tangs strike the clutch spring lips at the limits of travel. Listen also to the length of the interval between pings.

3) Repeat proceeding Steps 7.2.5.11.d.1 and 7.2.5.11.d.2 until inertia mass (11) is properly installed.

NOTE: Inertia mass endplay should be 0.005 to 0.020 inch. If necessary, alter quantity of flat washers (9 and 10) to obtain proper endplay.

12. From the following list, use the appropriate Truarc Pliers to install new flat washers (9 and 10); the new retaining ring (8) to secure part to shaft of leadscrew.

Snubber Model	Truarc Pliers Part No.
PSA-1	RE-015
PSA-3	RE-018
PSA-10	RE-03

13. Secure dust cover (2) in bore of housing (7) with new retaining ring (3).

14. Install housing (7). Using the appropriate Truarc Pliers, install new retaining ring (6), beveled side upward, to secure housing in place.

15. If replaced, screw end plug assembly (25) onto telescoping cylinder of support cylinder assembly until threads bottom out.

NOTE: Installation is okay if gauge will not enter gap between end plug assembly and telescoping cylinder, or enters gap with a maximum clearance of 0.010 inch.

16. Fully extend telescoping cylinder. Using Go/No-Go Gauge, check end plug assembly (25) for proper installation.

17. Using appropriate adapter and torque wrench, torque end plug assembly (25) to 50 inch pound (40-60in. lbs.). Document results in Attachment 2.

18. Adjust position of housing (7) so that flats of housing are parallel to sides of end plug assembly (25) within 0.030 inch.

19. Remove assembled arrestor from holding fixture.

20. Torque new setscrews (24) as follows:

a. Coat threads of new setscrews (24) with Loctite retaining compound.

b. Using hand torque driver and hex drive, install setscrews in end plug assembly and torque to following values.

Model	Torque (in.-lb)
PSA-1	15 in. lbs. (10 to 20)
PSA-3	20 in. lbs. (15 to 25)
PSA-10	20 in. lbs. (15 to 25)

c. Document setscrew torque in Attachment 2.

21. Slide position indicator tube (5) over telescoping tube of support cylinder assembly (33). Rotate tube until mounting holes in tube and end plug assembly (25) are aligned.

22. Coat threads of filister head screws (3) with Loctite retaining compound. Secure position indicator tube (5) to end plug assembly (33) with new filister head screws and new flat washers (4).

23. If new housing (7) was installed:

a. Remove drive screws (34) and nameplate (35) from old housing.

b. Secure nameplate to housing with new drive screws.

24. Adjust the housing (7) to the support cylinder assembly (33) as per the match mark of Step 7.2.1.5 as follows:

a. Lightly clamp the snubber in a soft jawed vice in a vertical position with the telescoping end (rear bracket) up.

NOTE: Do not relax the downward pressure and do not remove the retaining ring. Only relieve the grip enough to allow for free rotation of the lug.

b. Using the truarc pliers relax the grip of the retaining ring (6). Do not remove the retaining ring.

c. While pressing down on the paddle lug, turn the telescoping end to align the match marks then allow the retaining ring to seat solidly.

d. Remove the snubber from the vice and slowly stroke the snubber to check for binding.

NOTE: If the snubber is to be functionally tested with the extension tube removed, do not install the extension tube until after functional testing.

25. Install the rear bracket or extension tube as per match marks of Step 7.2.1.1 as follows:

a. Lubricate the bolts with Fel-Pro N-5000

b. Torque the Rear Bracket or the Extention tube to the following torque values:

Model	Torque (in. lbs.)
PSA-1	45 in. lbs (40 - 50 in. lbs.)
PSA-3	120 in lbs. (110 - 130 in. lbs.)
PSA-10	440 in. lbs. (420 - 460 in. lbs.)

c. Document actual torque on Attachment 2.

d. Lockwire with .040 inch diameter stainless steel lockwire.

e. Slowly stroke the snubber to ensure no binding.

7.2.6 Document the completion of Section 7.2 on Attachment 2.

7.3 Overhaul of Models PSA-35 and PSA-100

NOTE: Refer to Enclosure 3 for component identification and Enclosure 4 for special tools and fixtures.

7.3.1 Disassembly

NOTE (1): Disassembly is limited to removal of those parts and assemblies listed in the recommended spare parts list.

NOTE (2): Mark, or otherwise record, rotational alignment of end cap assembly (19) and support cylinder assembly (21) to aid in duplication of alignment during assembly.

CAUTION
Do not disassemble inertia mass assembly (12), torque carrier assembly (14), end cap assembly (19), or support cylinder assembly (21); detail parts for these assemblies are not procurable. Each assembly is a critical item requiring special techniques and tooling for repair and overhaul.

1. Remove Position Indicator Tube (3) if not previously removed during test.

2. Install and clamp arrestor horizontally in appropriate holding fixture. Clamp around housing of support cylinder assembly (21).

3. Using mallet and punch, straighten deformations in locking washer (6) in three places to unlock adapter nut (4), or transition tube (5), from housing of support cylinder assembly (21).

4. Install appropriate torque wrench adapter on adapter nut (4), or on transition tube (5), depending upon configuration of arrestor being disassembled. Engage adapter setscrews with slots of nut or tube.

5. Insert breaker bar in socket or torque wrench adapter. Using breaker bar as a lever, rotate adapter nut (4), or transition tube (5), counterclockwise until lose.

6. Remove breaker bar and torque wrench adapter ring.

7. Unscrew and remove adapter nut (4), or transition tube (5). Remove and discard locking washer (6).

8. Remove retaining ring (7) and dust cover (8) from bore of adapter nut (4), or transition tube (5).

9. Remove and discard cotter pin (9). Remove and discard castellated nut (10) and flat washer (2) to free inertia mass assembly (12) from torque carrier assembly (14).

10. Extract inertia mass assembly from bore of support cylinder assembly (21) housing.

    NOTE: The ring may be reached through the holes in the bottom of the torque carrier assembly (14).

11. Release retaining ring (7) from capstan. To release the retaining ring, use truarc pliers 0500 (PSA 35) or S-6700 (PSA 100).

12. With the retaining ring released, pull on the torque carrier (14) to remove it with assembled parts (11, 12, and 13) from the support cylinder assembly (21).

13. Remove washer (15) (PSA 35) or wear ring (15) (PSA 100) from pinion gear of torque carrier assembly (14).

14. Using needle nose pliers, remove one keeper ring (16) to free capstan spring (17) from bore of torque carrier assembly (14).

15. Remove and discard capstan spring (17) and second keeper ring (16).

CAUTION
WHEN PERFORMING FOLLOWING STEP 7.3.1.16, USE CARE TO AVOID SHEARING HEADS FROM FILISTER HEAD SCREWS (1). IF SUCH OCCURS, END CAP NUT (20) MUST BE REPLACED.

NOTE: Threads of filister head screws (1) are coated on installation with Loctite Retaining Compound to prevent loosening. To remove screws, it may be necessary to use a screwdriver and a adjustable wrench to develop sufficient torque to rotate screws. Attach adjustable wrench to shank of screwdriver, not to handle.

16. Remove filister head screws (1) and flat washers (11) to free position indicator tube (3) from end cap nut (20). Discard screws and flat washers.

17. Unscrew and remove end cap assembly (19) from telescoping cylinder of support cylinder assembly (21).

18. Rotate end cap nut (20) clockwise to remove.

NOTE: End cap nut (20) has left-hand threads and must be rotated clockwise, rather than counterclockwise to remove.

7.3.2 Cleaning

CAUTION
SOLVENT P-D-680 OR APPROVED EQUIVALENT IS TOXIC AND FLAMMABLE. AVOID PROLONGED CONTACT WITH SKIN AND KEEP AWAY FROM OPEN FLAME. USE ONLY IN A WELL-VENTILATED AREA.

CAUTION
EYE PROTECTION SHOULD BE WORN WHEN COMPRESSED AIR IS USED TO DRY PARTS.

CAUTION
DO NOT IMMERSE SUPPORT CYLINDER ASSEMBLY (21) IN SOLVENT. LEAKAGE OF SOLVENT INTO INTERIOR OF SUPPORT CYLINDER ASSEMBLY WILL REMOVE LUBRICANT FROM INTERNAL PARTS WHICH CANNOT BE RELUBRICATED.

1. Wash all disassembled parts, except support cylinder assembly (21), in solvent, using a non-metallic brush to loosen caked sediment and other foreign material.

2. Wipe external surfaces of support cylinder assembly (21) with a clean lint-free cloth moistened with solvent.

3. Dry all parts using a clean lint-free cloth and/or clean compressed air at 20 psig. maximum.

7.3.3 Inspection

NOTE (1): Replace any part that cannot be repaired or reworked to meet inspection requirements.

NOTE (2): If defective part is repairable, note defect and assign part for repair.

1. Complete the following inspection:

   NOTE: Brinell marks are allowable at edges of torque carrier assembly (14) that contact tangs of capstan spring (17).

   a. Visually check all parts are clean and free from corrosion and deterioration.

   b. Check to be sure that all rivets and drive screws are tight, and that the unremoved retaining rings, screws, bearings, etc., are securely in place.

   c. Visually check all threaded parts for crossed or damaged threads. Reject parts if thread damage exceeds 50 percent of one thread. If damage to any one thread is 50 percent or less, document defect in Remarks of Attachment 3.

   d. Check finishes of all metal parts for damaged or worn-through areas. Document any defects in Remarks of Attachment 3.

   e. Check all parts for burrs, nicks, scratches, cracks, or structural damage. Document any defect in Remarks of Attachment 3.

2. Perform the following detail inspection. Refer to Sheet 3 of Enclosure 3 for locations of detail parts and assemblies listed. Document results on Attachment 3.

	NOMENCLATURE AND INDEX NO. (SHEET 3 OF ENCLOSURE 3)	TYPE OF INSPECTION	CHECK	ACCEPTANCE CRITERIA
a.	Inertia Mass Assembly (12)	Visual	Clutch spring for secure installation in shell, and for evidence of deformation.	Spring shall be securely installed. There shall be no deformation.
			Check shell for evidence of damage.	No cracks, breaks or gouges shall be evident.
			Check hub for secure riveting to shell and for evidence of scoring on hub shaft caused by defective needle bearing in torque carrier assembly.	Hub shall be securely riveted in place. There shall be no scoring on hub shaft.
b.	Torque Carrier Assembly (14)	Visual	Check bearings for freedom of rotation and for evidence of looseness. Check pinion rear splines for nicks, chips, or cracks.	Bearings shall rotate smoothly, without binding. Bearings shall be securely installed.
c.	End Cap Assembly (19)	Visual	Check bearing for freedom of rotation and security of installation. Bearings shall be securely installed.	Bearing shall rotate smoothly without binding.
			Bearing ID for evidence of elongation or damage.	None allowed.
d.	Position Indicator Tube (3)	Visual	Evidence of deformation which may cause bore to bind on support cylinder during operation.	Bore of position indicator tube shall be round and not interfere with outside diameter of support cylinder.

	NOMENCLATURE AND INDEX NO. (SHEET 3 OF ENCLOSURE 3)	TYPE OF INSPECTION	CHECK	ACCEPTANCE CRITERIA
e.	Support Cylinder Assembly (21)	Operational	Extend and retract telescoping cylinder through several complete cycles (0 to 6 inches on scale).	Telescoping cylinder shall extend and retract through full stroke without hesitation or binding.
f.	Nameplate (23)	Visual	Check nameplate for security of attachment.	Nameplate shall be securely attached by drive screws (22).

7.3.4 Repair and Replacement

1. Replace all parts or assemblies that are damaged or worn.

   NOTE (1): Brinell marks are allowable at edges of torque carrier assembly (14) that contact tangs of capstan spring (17).

   NOTE (2): Replace inertia mass assembly (12) torque carrier assembly (14), end cap assembly (19), or support cylinder assembly (21) as an assembly of any part is defective. Detail parts of these assemblies are not procurable separately.

2. Replace locking washer (6), cotter pin (9), catellated nut (10), flat washers (2 and 11), keeper rings (16), capstan spring (17), and filister head screws (1) at each overhaul, regardless of condition.

3. Replace parts where damage prevents complete and proper mating of parts and sealing surfaces.

4. Repair threaded parts, if damage to one thread is 50 percent, or less, by chasing threads with appropriate tap or die. Do not repair screws.

5. Clean all parts removed or reworked as described in cleaning, Section 7.3.2.

7.3.5 Assembly

1. Lubricate parts as follows:

NOTE: Use lubricant specified in Section 5.4 only. No substitute is approved for use in the arrestor.

a. Using a soft-bristle brush, apply a light film of lubricant to threads of adapter nut (4), or transition tube (5), end cap assembly (19), and end cap nut (20).

1) Using a soft-bristle brush, apply a light film of lubricant to splines of pinion gear.

2) Pack ball bearings and needle bearings so that the cavity around the balls or needles is approximately half filled with grease. Use fingers for the ball bearings and a small probe, stick or syringe for the needle bearings.

b. Lubricate support cylinder assembly (21) as follows:

1) Using a soft-bristle brush, apply a light film of lubricant to threads of telescoping cylinder and cylinder housing, and to splines of planetary gears until lubricant is distributed evenly over splined surfaces.

2) Manually extend and retract telescoping cylinder to rotate planetary gears until lubricant is distributed evenly over splined surfaces.

NOTE: Clamp holding fixture around housing of support cylinder assembly (21), not around telescoping cylinder.

2. Install and clamp support cylinder assembly (21) horizontally in appropriate holding fixture.

NOTE: End cap nut (20) has left-hand threads and must be rotated counterclockwise, rather than clockwise, to tighten.

3. Install end cap nut (20) on telescoping cylinder of support cylinder assembly (21).

a. Manually rotate end cap nut counterclockwise until finger tight against shoulder of telescoping cylinder.

4. Install end cap assembly (19) in telescoping cylinder until end cap bottoms against telescoping cylinder.

NOTE (1): Rotate end cap assembly (19) clockwise to tighten. Just before end cap assembly bottoms on telescoping cylinder, rotate end cap assembly with a quick, snappy motion so that it seats snugly against cylinder.

NOTE (2): This adjustment is necessary to assure proper orientation of end cap assembly (19) with accessory parts during installation.

CAUTION
ROTATION OF END CAP ASSEMBLY (19) SHALL BE RESTRICTED TO MINIMUM NECESSARY TO OBTAIN ALIGNMENT. UNDER NO CIRCUMATANCE SHALL END CAP ASSEMBLY BE ROTATED MORE THAN ONE TURN FROM ITS BOTTOMED POSITION ON END CAP NUT (20).

5. Rotate end cap assembly (19) counterclockwise until alignment marks placed on end cap assembly and support cylinder assembly (21) are aligned.

6. Torque end cap nut (20) to 150 ft. lbs. as follows:

a. Using two screws provided, secure appropriate torque wrench adapter to end cap nut (20).

b. Insert torque wrench in socket of torque wrench adapter.

c. Using torque wrench as a lever, rotate end cap nut (20) clockwise, against end cap assembly (19), until torque wrench clutch slips, indicating that proper torque has been applied. Document torque on Attachment 3.

d. Remove torque wrench and torque wrench adapter.

7. Install capstan spring as follows:

   a. Using needle nose pliers, install one new keeper ring (18) in bottom slot in bore of shell of torque carrier assembly (14).

   b. Install new capstan spring (17).

   c. Install Second new keeper ring (18).

   NOTE: Washer (15) and wear ring (15) perform the same function.

8. Install washer (15) PSA 35) or wear ring (15) PSA 100) on pinion gear of torque carrier assembly (14). Apply a light coat of grease to washer or wear ring.

9. Slide torque carrier assembly (14), with assembled parts (15, 12, and 17) on capstan of support cylinder assembly (21).

   a. Wiggle torque carrier assembly back and forth until pinion gear engages planetary gears and torque carrier is fully seated.

   b. Using Truarc Pliers, install retaining ring in capstan.

   c. Ensure that retaining ring is properly seated.

10. Manually extend and retract telescoping cylinder while observing torque carrier assembly (14) for freedom of rotation.

11. Install inertia mass assembly (12) in accordance with the following instructions:

CAUTION
WHEN INSTALLED, BOTH TANGS OF CAPSTAN SPRING (17) MUST BE LOCATED IN SLOT OF INERTIA MASS SHELL, BETWEEN CLUTCH SPRING LIPS. SINCE INSTALLATION OF INERTIA MASS ASSEMBLY (12) IS A BLIND PROCEDURE. PAY STRICT ATTENTION TO THE FOLLOWING INSTRUCTIONS TO VERIFY PROPER INSTALLATION. IMPROPER INSTALLATION OF INERTIA MASS ASSEMBLY WILL CAUSE IMPROPER BRAKING ACTION OF THE ARRESTOR DURING OPERATION.

a. Rotate the torque carrier assembly (14) until the tangs of the capstan spring (17) are pointing up.

b. Visually align slot in shell of inertia mass assembly (12) so that tangs of capstan spring (17) are centered between lips of clutch spring of inertia mass assembly.

c. With bolt of torque carrier assembly (14) centered in hub of inertia mass assembly (12), and tangs of capstan spring (17) visually centered between lips of clutch spring, carefully slide inertia mass assembly straight in until bottomed.

d. Verify that tangs of capstan spring (17) are properly centered as follows:

1) Rotate inertia mass assembly (12) quickly clockwise and counterclockwise on bolt of torque carrier assembly (14).

NOTE (1): If capstan spring (17) tangs are properly centered, the interval between pings will be relatively short, the audible sound will be faint, and the rotational travel between pings will be limited to a few degree (approximately 5°).

NOTE (2): If capstan spring (17) tangs are improperly centered (only one tang, or neither, between clutch spring lips) the interval between pings will be several times longer, the audible sound will be louder, and the rotational travel between pings will be many degrees greater (approximately 30°).

2) While maintaining a relatively constant rotational speed, listen for an audible "ping" as the capstan spring tangs strike the clutch spring lips at the limits of travel. Listen also the length of the interval between pings.

3) Repeat preceding steps (1) and (2) until certain that inertia mass (12) is properly installed.

12. Secure inertia mass assembly (12) to bolt of torque carrier assembly (14) with new castellated nut (10) and new flat washer (2).

13. Tighten castellated nut (10) against washer; then, rotate nut counterclockwise until next groove is aligned with cotter pin hole in bolt of torque carrier assembly (14).

14. Install cotter pin (9) to retain castellated nut (10).

15. Secure dust cover (8) in bore of adapter nut (4), or transition tube (5), with retaining ring (7). Make certain that retaining ring is properly seated in groove.

16. Seat new locking washer (6) on flange of adapter nut (4), or transition tube (5), depending upon configuration of arrestor being assembled.

17. Install adapter nut, or transition tube, in housing of support cylinder assembly (21). Manually tighten nut, or tube, until bottomed against housing.

18. Torque adapter nut or tansition tube to 150 ft. lbs. (140 - 160 ft. lbs.) as follows:

    a. Verify that locking washer (6) is seated flat between housing of support cylinder assembly (21) and flange of adapter nut (4), or transition tube (5).

    b. Install appropriate torque wrench adapter on adapter nut (4), or transition tube (5), engaging setscrews of adapter with slots of nut or tube.

    c. Insert torque wrench in socket of torque wrench adapter.

    d. Using torque wrench as a lever, rotate adapter nut (4), or transition tube (5), clockwise until torque wrench clutch slips, indicating that proper torque has been applied. Document torque on Attachment 3.

19. Remove torque wrench and torque wrench adapter.

20. Using mallet and punch, deform locking washer (6) a minimum bend radius of 60° in three places:

    a. One into housing slot of support cylinder assembly (21)

    b. Two into slots of adapter nut (4), or transition tube (5).

21. If new support cylinder assembly (21) was installed:

    a. Remove drive screws (22) and nameplate (23) from old support cylinder assembly.

    b. Secure nameplate (23) to support cylinder assembly with new drive screws.

22. Remove assembled arrestor from holding fixture.

23. Slide position indicator tube (3) over telescoping tube of support cylinder assembly (21). Rotate tube until mounting holes in tube and end cap nut (20) are aligned.

24. Coat threads of filister head screws (1) with Loctite retaining compound. Secure position indicator tube (3) to end cap nut (20) with new filister head screws (1) and new flat washers (2).

25. Install transition tube (5), if applicable.

7.3.6 Document completion of Seciton 7.3 on Attachment 3.

7.4 Paddle Bearing Replacement

7.4.1 To remove a paddle bearing, drive the old bearing from its hole using a brass drive pin and hammer.

7.4.2 To install a new paddle bearing, proceed as follows:

1. Prior to reinstallation of bearing:

   a. Remove any metal burrs from hole in eyerod.

   b. Check spherical bearing for burrs, dirt, grit or rust. Clean inside and outside of spherical bearing if required.

2. Center the race of the spherical bearing in the hole. If reinstalling a split race type bearing, position the split on center line toward the threaded end of assembly, see Figure 1 of Enclosure 5. Check to see that the bearing moves freely inside the race.

3. Place the assembly on the wood block so that the spherical ball of bearing is centered in the hole in the block, see Figure 2 of Enclosure 5.

4. Use a center punch and ball peen hammer to stake the bearing in four places for small bearings, six places for PSA-35 and 100, on each side approximately 1/16" from the edge of the hole. Depth of stake should be only enough to retain bearing race in place.

5. Check to insure bearing rotates freely in the race.

7.5 Post Maintenance Inspection, Testing and Restoration

7.5.1 Functionally test the snubber in accordance with Reference 3.1.3. Document results on the appropriate Attachment.

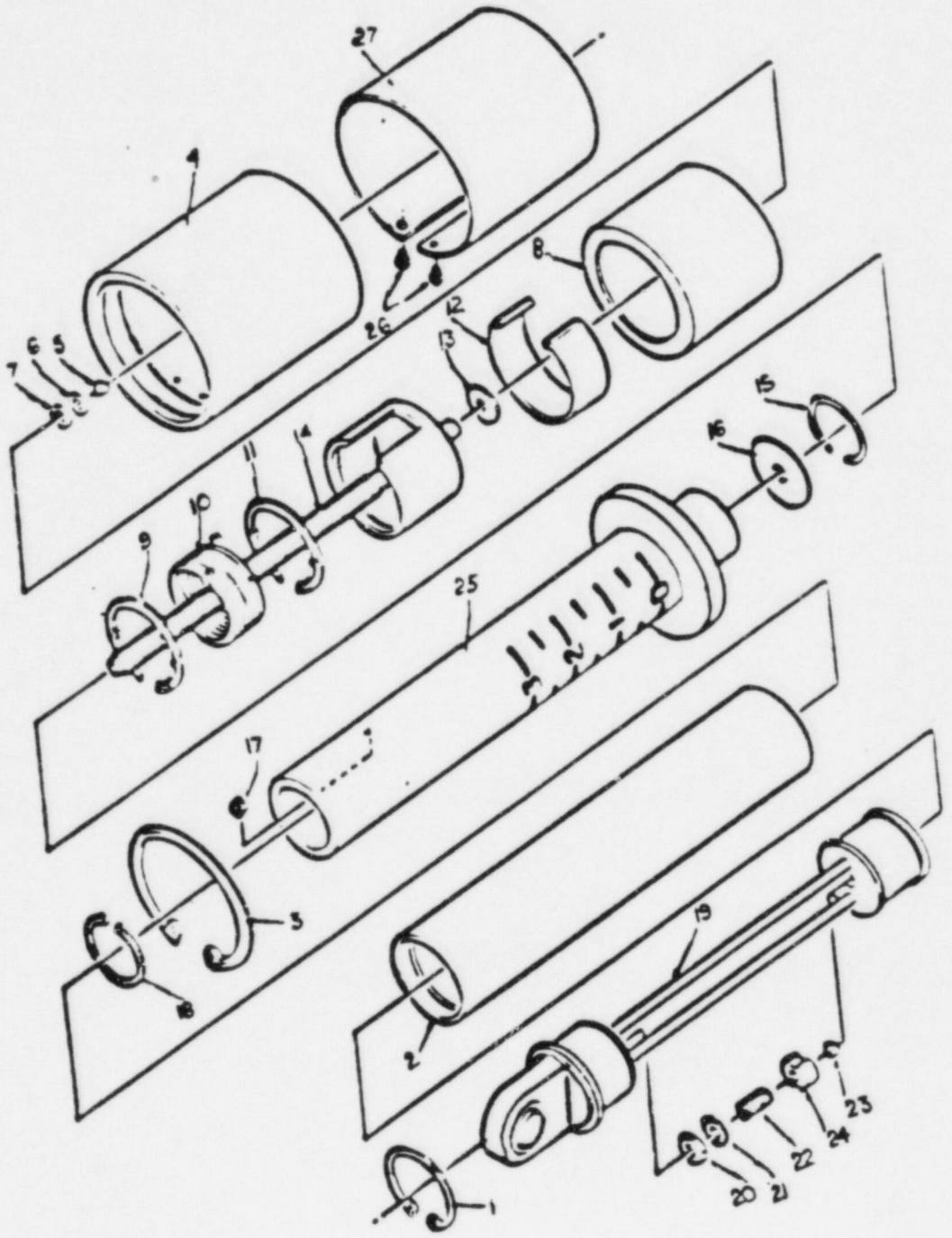
7.5.2 Ensure that all equipment labels and/or nameplates are reinstalled.

7.5.3 After completion of the work, the Protection Leader/ Work Leader shall sign the Maintenance Order and process the PN-21 in accordance with Reference 3.1.1.

END OF TEXT

PSA-1/4 AND PSA-1/2 SNUBBER ILLUSTRATION, PARTS LIST, INSPECTION LOCATIONS AND REFERENCE POINTS

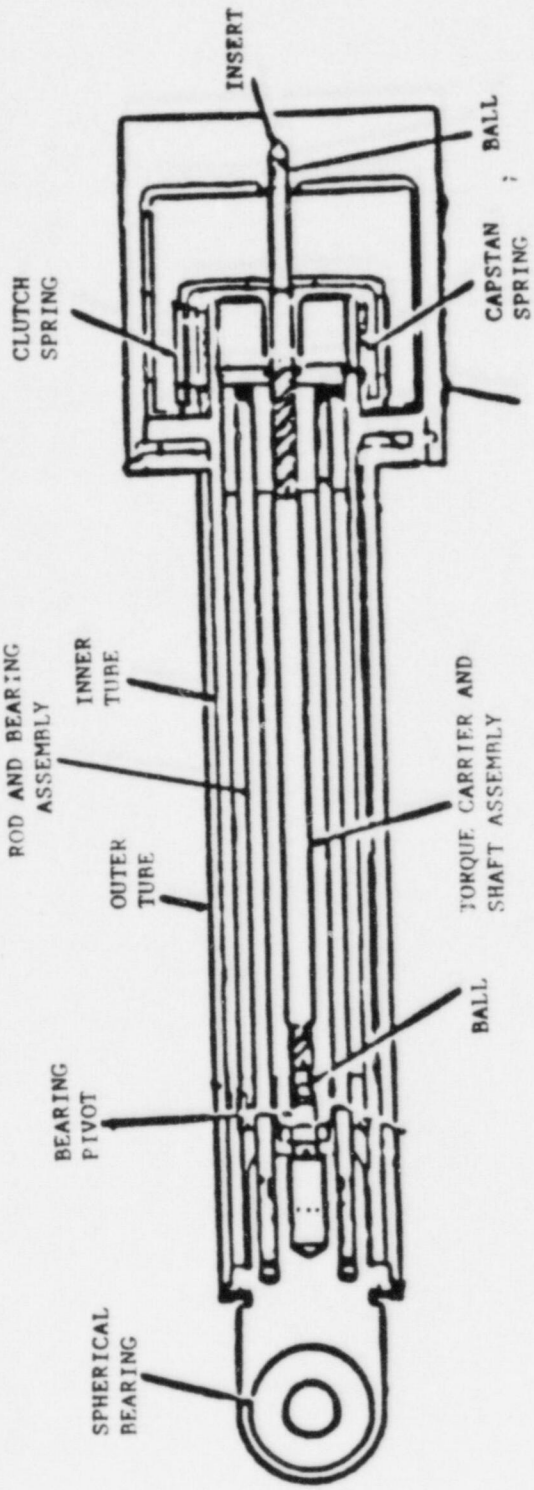
PSA-1/4 AND PSA-1/2 SNUBBER



PSA-1/4 AND PSA-1/2 PARTS LIST

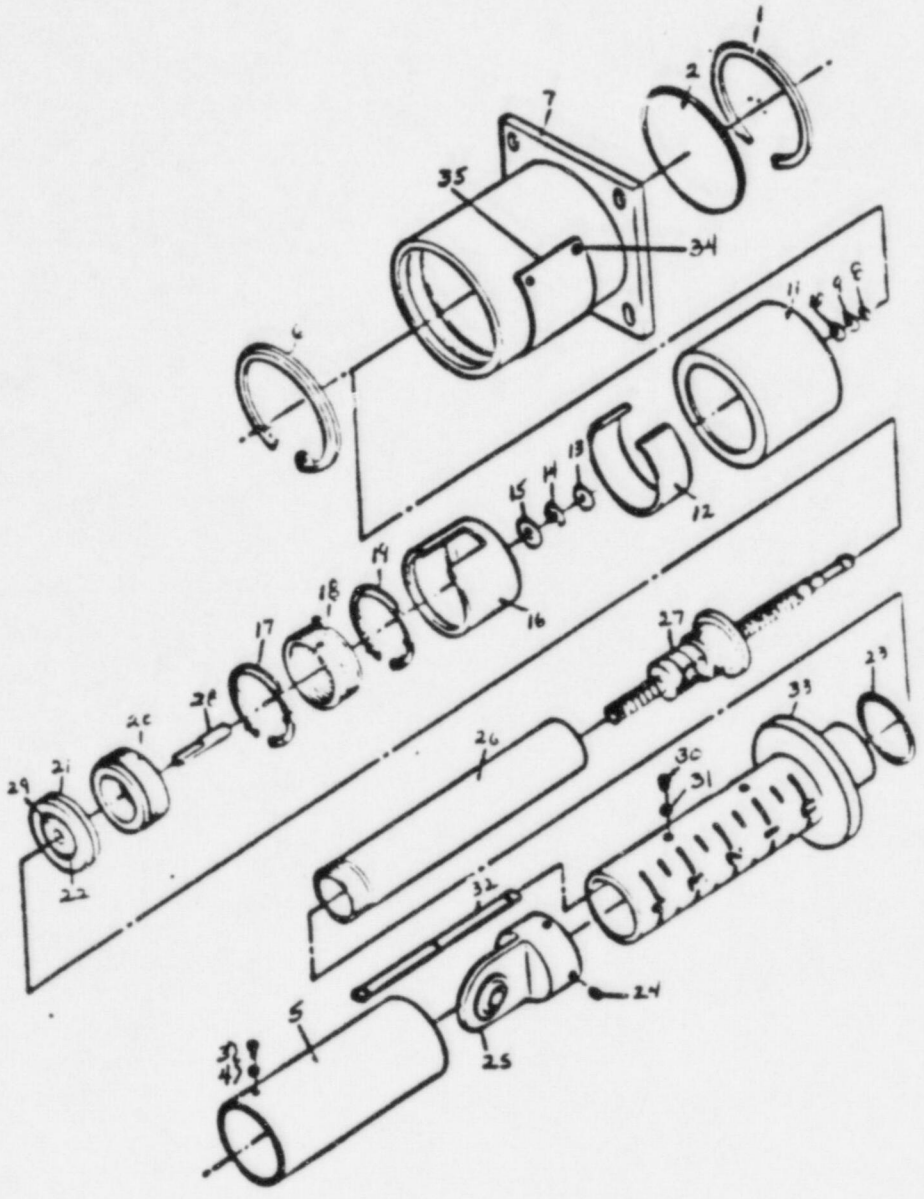
FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
-1-	1801104-05	ARRESTOR, Mechanical Shock, Model PSA-1/4.	REF	A
-1-	1801104-07	ARRESTOR, Mechanical Shock, Model PSA-1/2.	REF	B
-1	0911100-89	. RING, Retaining.	1	
-2	1801247-01	. TUBE, Outer.	1	A
	1801247-03	. TUBE, Outer.	1	B
-3	0911100-90	. RING, Retaining.	1	
-4	1801900-01	. HOUSING AND INSERT ASSEMBLY.	1	
-5	1801367-01	. BALL	1	
-6	0903100-36	. WASHER	2	
-7	0903100-37	. WASHER	AR	
-8	1801241-01	. INERTIA MASS	1	
-9	1801537-01	. RING, Keeper	1	
-10	1801612-01	. SPRING, Capstan.	1	
-11	1801537-01	. RING, Keeper	1	
-12	1801305-01	. SPRING, Clutch	1	
-13	0903100-50	. WASHER, Flat	1	
-14	1801861-01	. CARRIER AND SHAFT ASSEMBLY, Torque	1	A
	1801862-01	. CARRIER AND SHAFT ASSEMBLY, Torque	1	B
-15	0911100-91	. RING, Retainer	1	
-16	1801306-01	. WASHER, Support.	1	
-17	1801303-01	. KEY, Anti-rotation	1	
-18	0911100-88	. RING, Retaining.	1	
-19	1801533-01	. ROD AND BEARING ASSEMBLY	1	A
	1801533-01	. ROD AND BEARING ASSEMBLY	1	B
-20	NAS671-8	. NUT, Jamb.	1	
-21	MS35335-31	. WASHER, Lock	1	
-22	1801311-01	. BEARING, Pivot	1	
-23	1801367-01	. BALL	1	
-24	1801252-01	. GUIDE PLATE.	1	A
-25	1801250-01	. TUBE, Inner.	1	B
	1801250-03	. TUBE, Inner.	1	
-26	AN535-2-2	. SCREW, Drive	4	
-27	1801301-01	. NAMEPLATE.	1	

PSA-1/4 AND PSA-1/2 INSPECTION LOCATION AND REFERENCE POINTS



PSA-1, PSA-3, AND PSA-10 PARTS ILLUSTRATION, PARTS LIST, AND INSPECTION LOCATION REFERENCE POINTS

PSA-1, PSA-3 AND PSA-10 PARTS ILLUSTRATIONS



PSA-1, PSA-3, AND PSA-10 PARTS LIST

FIG. & ITEM NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
-1-	1801102-05	ARRESTOR, Mechanical Shock, Model PSA-1. .	REF	A
-1-	1801106-05	ARRESTOR, Mechanical Shock, Model PSA-3. .	REF	B
-1-	1801103-07	ARRESTOR, Mechanical Shock, Model PSA-10 .	REF	C
-1	0911100-84	. RING, Retaining.	1	A
	0911100-80	. RING, Retaining.	1	B
	0911100-96	. RING, Retaining.	1	C
-2	1801232-01	. COVER, Dust.	1	A
	1801260-01	. COVER, Dust.	1	B
	1801217-01	. COVER, Dust.	1	C
-3	AN503-8-4	. SCREW, Filister head	3	A
	AN501A10-4	. SCREW, Filister head	3	B
	AN501A10-5	. SCREW, Filister head	3	C
-4	AN960-8	. WASHER, Flat	3	A
	AN960-10L	. WASHER, Flat		B,C
-5	1801238-05	. TUBE, Position indicator	1	A
	1801267-05	. TUBE, Position indicator	1	B
	1801216-05	. TUBE, Position indicator	1	C
-6	0911100-98	. RING, Retaining.	1	A
	0911100-81	. RING, Retaining.	1	B
	0911100-97	. RING, Retaining.	1	C
-7	1801281-05	. HOUSING.	1	A
	1801274-05	. HOUSING.	1	B
	1801360-07	. HOUSING.	1	C
-8	0911100-111	. RING, Retaining.	1	A
	0911100-110	. RING, Retaining.	1	B
	0911100-109	. RING, Retaining.	1	C
-9	0903100-41	. WASHER, Flat	1	A
	0903100-33	. WASHER, Flat	AR	B
	0903100-39	. WASHER, Flat	1	C
-10	0903100-23	. WASHER, Flat	AR	A
	0903100-33	. WASHER, Flat	AR	B
	0903100-38	. WASHER, Flat	1	C
-11	1801224-03	. INERTIA MASS	1	A
	1801276-01	. INERTIA MASS	1	B
	1801205-01	. INERTIA MASS	1	C
-12	1801288-01	. SPRING, Clutch	1	A
	1801272-01	. SPRING, Clutch	1	B
	1801201-01	. SPRING, Clutch	1	C
-13	0903100-41	. WASHER, Flat	1	A
	0903100-33	. WASHER, Flat	AR	B
	0903100-39	. WASHER, Flat	1	C

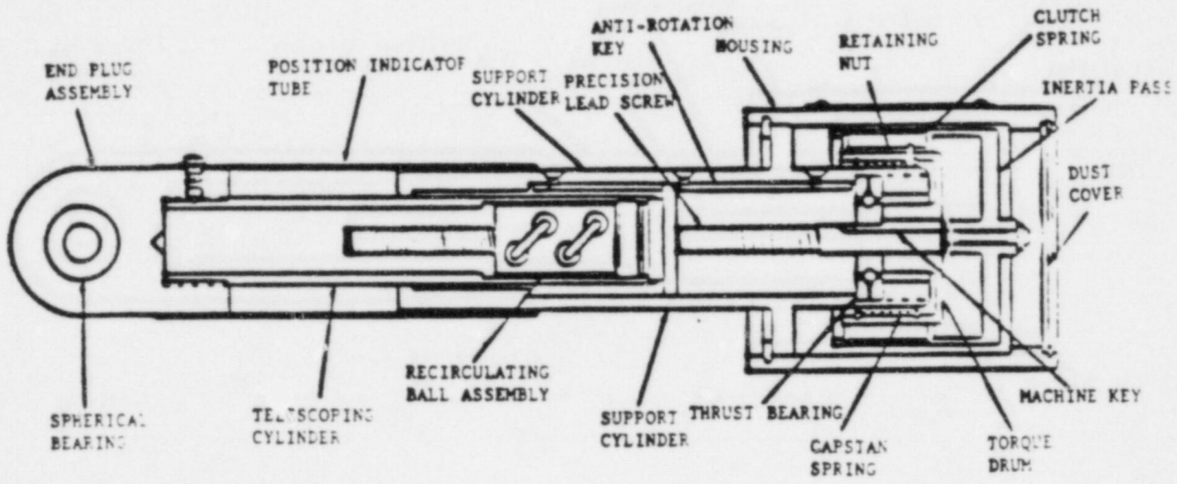
PSA-1, PSA-3, AND PSA-10 PARTS LIST

FIG. & ITEM NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
-14	0911100-99	. RING, Retaining.	1	A
	0911100-100	. RING, Retaining.	1	B
	0911100-101	. RING, Retaining.	1	C
-15	0903100-42	. WASHER, Flat	AR	A
	AN960-716	. WASHER, Flat	AR	B
	0903100-43	. WASHER, Flat	AR	B
	0903100-45	. WASHER, Flat	AR	C
-16	1801218-03	. DRUM, Torque	1	A
	1801275-03	. DRUM, Torque	1	B
	1801206-01	. CARRIER, Torque.	1	C
-17	1801538-01	. RING, Keeper	1	A
	1801539-01	. RING, Keeper	1	B
	1801540-01	. RING, Keeper	1	C
-18	1801613-01	. SPRING, Capstan.	1	A
	1801614-01	. SRRING, Capstan.	1	B
	1801615-01	. SPRING, Capstan.	1	C
-19	1801538-01	. RING, Keeper	1	A
	1801539-01	. RING, Keeper	1	B
	1801540-01	. RING, Keeper	1	C
-20	1801235-01	. NUT, Bearing retainer.	1	A
	1801262-01	. NUT, Bearing retainer.	1	B
	1801214-01	. NUT, Bearing retainer.	1	C
-21	1801236-01	. RACE, Thrust outer (For replacement order Kit No. 1811041-01).	2	A
	1811041-01	. KIT, Thrust bearing (Replacement for Part No. 1801236-01)	REF	A
	1801442-01	. RACE ASSEMBLY, Outer (For replacement order Kit No. 1811042-01).	2	B
	1811042-01	. KIT, Thrust bearing (Replacement for Part No. 1801442-01)	REF	B
	1801443-01	. RACE ASSEMBLY, Outer (For replacement order Kit No. 1811043-01).	2	C
	1811043-01	. KIT, Thrust bearing (replacement for Part No. 1801443-01)	REF	C
-22	**1801493-02	. BALL (0.1860 inch/4.724 mm diameter) (Included in Kit No. 1811041-01) . . .	8	A
	**1801493-03	. BALL (0.1865 inch/4.737 mm diameter) (Included in Kit No. 1811041-01) . . .	8	A
	**1801493-02	. BALL (0.1860 inch/4.724 mm diameter) (Included in Kit No. 1811042001) . . .	12	B
	**1801493-03	. BALL (0.1865 inch/4.737 mm diameter) (Included in Kit No. 1811042-01) . . .	12	B
	**1801493-02	. BALL (0.1860 inch/4.724 mm diameter) (Included in Kit No. 1811043-01) . . .	16	C
	**1801493-03	. BALL (0.1865 inch/4.737 mm diameter) (Included in Kit No. 1811043-01)	16	C

PSA-1, PSA-3, AND PSA-10 PARTS LIST

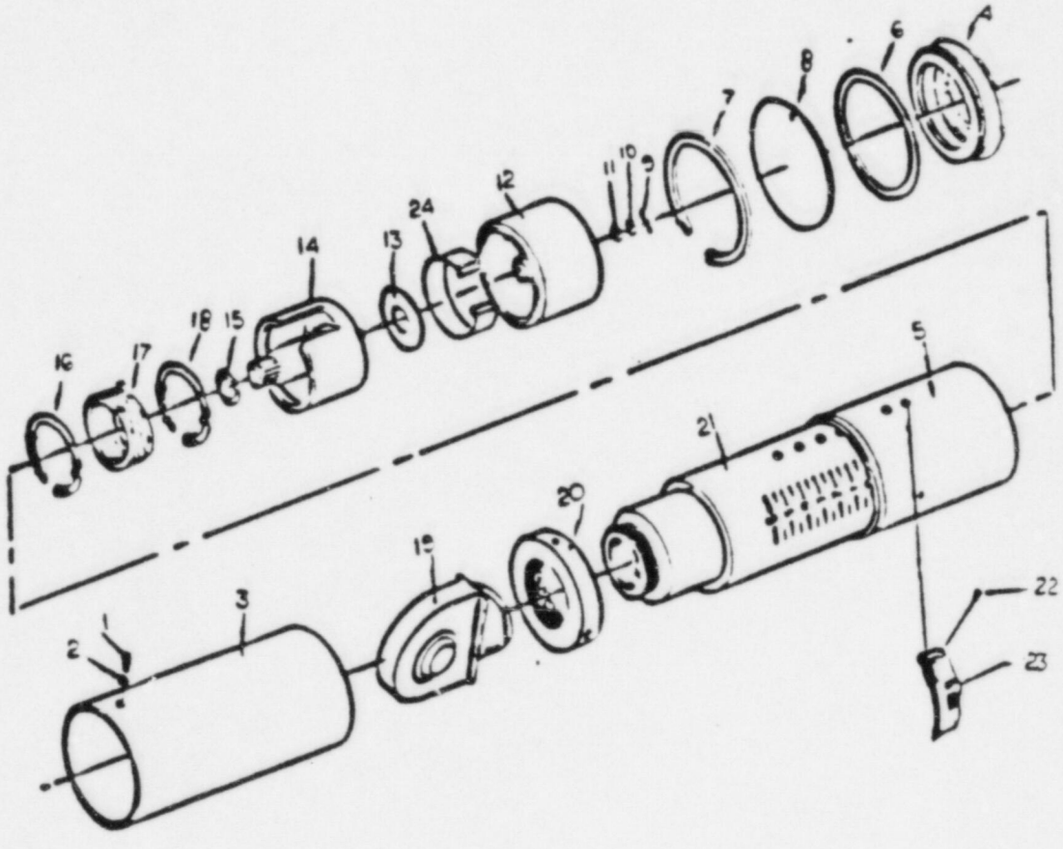
FIG. 6 ITEM NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
-23	0911100-82	. RING, Retaining.	1	B
-24	AN565B8H3	. SETSCREW	3	A
	AN565B1032H4	. SETSCREW	3	B
	AN565B1032H3	. SETSCREW	3	C
-25	1801860-01	. PLUG ASSEMBLY, End	1	A
	1801858-01	. PLUG ASSEMBLY, End	1	B
	1801856-01	. PLUG ASSEMBLY, End	1	C
-26	1801227-01	. CYLINDER, Telescoping.	1	A
	1801270-01	. CYLINDER, Telescoping.	1	B
	1801211-01	. CYLINDER, Telescoping.	1	C
-27	1801382-01	. SCREW ASSEMBLY, Ball bearing	1	A
	1801324-01	. SCREW ASSEMBLY, Ball bearing	1	B
	1801384-01	. SCREW ASSEMBLY, Ball bearing	1	C
-28	1801287-01	. KEY, Machine	1	A
	1801280-03	. KEY, Machine	1	B
	1801298-01	. KEY, Machine	1	C
-29	1801230-01	. RACE, Inner thrust (For replacement order Kit No. 181141-01)	1	A
	1811041-01	. KIT, Thrust bearing (Replacement for Part No. 1801230-01)	REF	A
	1801264-01	. RACE, Inner thrust (For replacement order Kit No. 1811042-01).	1	B
	1811042-01	. KIT, Thrust bearing (Replacement for Part No. 1801264-01)	REF	B
	1801391-01	. RACE, Inner thrust (For replacement order Kit No. 1811043-01).	1	C
	1811043-01	. KIT, Thrust bearing (Replacement for Part No. 1801391-01)	REF	C
-30	MS24694-S1	. SCREW, Flathead.	3	A,B
	MS24694-S92	. SCREW, Flathead.	3	C
-31	MS35790-9	. WASHER, Lock	3	A,B
	MS35790-25	. WASHER, Lock	3	C
-32	1801234-01	. KEY, Anti-rotation	1	A
	1801265-01	. KEY, Anti-rotation	1	B
	1801212-01	. KEY, Anti-rotation	1	C
-33	1801226-01	. CYLINDER, Support.	1	A
	1801277-01	. CYLINDER, Support.	1	B
	1801210-01	. CYLINDER, Support.	1	C
-34	AN535-2-2	. SCREW, Drive	4	
-35	1801301-01	. NAMEPLATE.	1	

PSA-1, PSA-3 AND PSA-10 INSPECTION LOCATION REFERENCE POINTS



PSA-35 AND PSA-100 PARTS ILLUSTRATION, PARTS LIST AND INSPECTION LOCATION REFERENCE POINTS

PSA-35 AND PSA-100 PARTS ILLUSTRATION



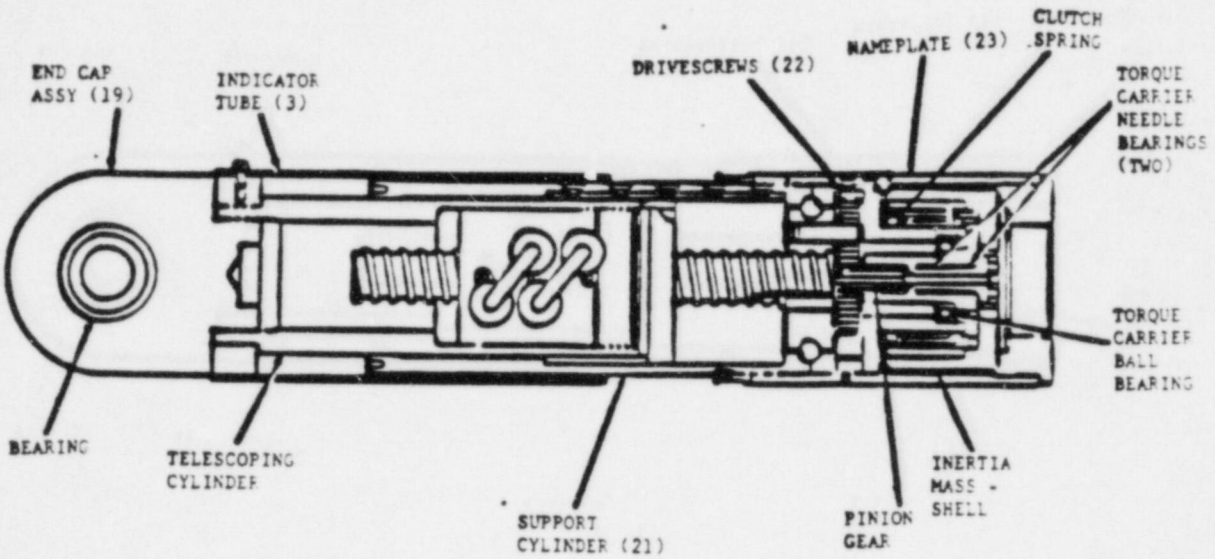
PSA-35 AND PSA-100 PARTS LIST

FIG. 6 INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY.	USABLE ON CODE
-1-	1801112-09	ARRESTOR, Mechanical Shock, Model PSA-35 .	REF	A
	1801112-11	ARRESTOR, Mechanical Shock, Model PSA-35 .	REF	B
	1801112-13	ARRESTOR, Mechanical Shock, Model PSA-35 .	REF	C
	1801119-09	ARRESTOR, Mechanical Shock, Model PSA-100.	REF	D
	1801119-11	ARRESTOR, Mechanical Shock, Model PSA-100.	REF	E
	1801119-13	ARRESTOR, Mechanical Shock, Model PSA-100.	REF	F
-1	AN501-416-8	. SCREW, Filister head	3	A,B,C
	AN501-516-10	. SCREW, Filister head	3	D,E,F
-2	AN960-416L	. WASHER, Flat	AR	A,B,C
	AN960-516L	. WASHER, Flat	AR	D,E,F
-3	1801455-03	. TUBE, Indicator.	1	A,B,C
	1801438-03	. TUBE, Indicator.	1	D,E,F
-4	1801506-05	. NUT, Adapter	1	A
	1801506-07	. NUT, Adapter	1	B
	1801507-05	. NUT, Adapter	1	D
	1801507-07	. NUT, Adapter	1	E
-5	1801480-01	. TUBE, Transition	1	C
	1801478-01	. TUBE, Transition	1	F
-6	1801497-01	. WASHER, Locking.	1	A,B,C
	1801526-01	. WASHER, Locking.	1	D,E,F
-7	0911100-80	. RING, Retaining.	1	A,B,C
	0911100-106	. RING, Retaining.	1	D,E,F
-8	1801260-01	. COVER, Dust.	1	A,B,C
	1801217-03	. COVER, Dust.	1	D,E,F
-9	MS24665-152	. PIN, Cotter.	1	
-10	AN310-4	. NUT, Castellated	1	
-11	AN960-416	. WASHER, Flat	AR	A,B,C
	AN960-416L	. WASHER, Flat	AR	D,E,F
-12	1801858-01	. INERTIA MASS ASSEMBLY.	1	A,B,C
	1801863-01	. INERTIA MASS ASSEMBLY.	1	D,E,F
-13	0903100-45	. WASHER	1	D,E,F
-14	1801867-01	. CARRIER ASSEMBLY, Torque	1	A,B,C
	1801865-01	. CARRIER ASSEMBLY, Torque	1	D,E,F
-15	0903100-48	. WASHER	1	A,B,C
	1801524-01	. RING, Wear	1	D,E,F
-16	1801540-01	. RING, Keeper	1	A,B,C
	1801611-01	. RING, Keeper	1	D,E,F
-17	1801615-01	. SPRING, Capstan.	1	A,B,C
	1801617-01	. SPRING, Capstan.	1	D,E,F

PSA-35 AND PSA-100 PARTS LIST

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY.	USABLE ON CODE
-18	1801540-01	. RING, Keeper	1	A,B,C
	1801611-01	. RING, Keeper	1	D,E,F
-19	1801546-03	. CAP ASSEMBLY, End.	1	A,B,C
	1801545-03	. CAP ASSEMBLY, End.	1	D,E,F
-20	1801451-03	. NUT, End Cap	1	A,B,C
	1801432-03	. NUT, End Cap	1	D,E,F
-21	1801866-01	. CYLINDER ASSEMBLY, Support	1	A,B,C
	1801864-01	. CYLINDER ASSEMBLY, Support	1	D,E,F
-22	AN535-2-2	. SCREW, Drive	4	
-23	1801301-01	. NAMEPLATE.	1	
-24	1801201-01	. SPRING, Clutch	1	A,B,C
	1801409-01	. SPRING, Clutch	1	D,E,F

PSA-35 AND PSA-100 INSPECTION LOCATION REFERENCE POINTS



PSA-1/4, PSA-1/2, PSA-1, PSA-3, PSA-10, PSA-35 AND PSA-100
SPECIAL TOOLS AND FIXTURES

PSA-1/4 AND PSA-1/2

DISASSEMBLY TOOLS

Adaptor, Jam Nut, Part No. 1801104-AT-2-1	Pacific Scientific
Pivot Bearing Driver, Part No. 1801104-AT-2-2 . .	Pacific Scientific
Pliers, Needle Nose	Commercially Available
Pliers, Truarc, Part No. 03 and 05.	Waldes Kohinoor Inc. 47-16 Austel Place Long Island City, NY 11101

ASSEMBLY TOOLS

Pivot Bearing, Driver, Part No. 1801104-AT-2-2. .	Pacific Scientific
Adaptor, Jam Nut, Part No. 1801104-AT-2-1	Pacific Scientific
Torque Wrench, Part No. 6003.	Torvaal 524 Washington St. Chagrin Falls, OH 44022
Pliers, Truarc, Part No. 01, 03 and 05.	Waldes Kohinoor Inc. 47-16 Austel Place Long Island City, NY 11101
Bearing, Part No. 1801532-01.	Pacific Scientific
Magnet Tool, Part No. 1801104-MIT-2	Pacific Scientific

PSA-1, PSA-3, AND PSA-10

DISASSEMBLY TOOLS

Adaptor, Torque Wrench, End Plug:
- Part No. 1801102AT9 (Model PSA-1). . . . . Pacific Scientific
- Part No. 1801106AT9 (Model PSA-3). . . . . Pacific Scientific
- Part No. 1801103AT9 (Model PSA-10) . . . . . Pacific Scientific

Fixture, Holding:
- Part No. 1801102AT5 (Model PSA-1). . . . . Pacific Scientific
- Part No. 1801106AT5 (Model PSA-3). . . . . Pacific Scientific
- Part No. 1801103AF1 (Model PSA-10) . . . . . Pacific Scientific
- Part No. 1801103AT4 (all). . . . . Pacific Scientific

Pliers, Truarc:
- Part No. 02. . . . . Waldes Kohinoor, Inc.
- Part No. RE-015 — 47-16 Austel Place
- Part No. S67, Heavy Duty — Long Island City, NY 11101

ASSEMBLY TOOLS

Adaptor, Torque Wrench, End Plug:
- Part No. 1801102AT9 (Model PSA-1). . . . . Pacific Scientific
- Part No. 1801106AT9 (Model PSA-3). . . . . Pacific Scientific
- Part No. 1801103AT9 (Model PSA-10) . . . . . Pacific Scientific

Fixture, Holding:
- Part No. 1801102AT5 (Model PSA-1). . . . . Pacific Scientific
- Part No. 1801106AT5 (Model PSA-3). . . . . Pacific Scientific
- Part No. 1801103AF1 (Model PSA-10) . . . . . Pacific Scientific

Gauge, Go/No-Go:
- Part No. 1801102GA2 (Model PSA-1). . . . . Pacific Scientific
- Part No. 1801106GA2 (Model PSA-3). . . . . Pacific Scientific
- Part No. 1801103GA2 (Model PSA-10) . . . . . Pacific Scientific

Pliers, Truarc:
- Part No. 02. . . . . Waldes Kohinoor Inc.
- Part No. RE-015 (Model PSA-1) — 47-16 Austel Place
- Part No. RE-018 (Model PSA-3) — Long Island City, NY 11101
- Part No. RE-031 (Model PSA-10)
- Part No. S67, Heavy Duty

PSA-35 AND PSA-100

DISASSEMBLY TOOLS

Adaptor, Torque Wrench, Adaptor Nut and Transition Tube:
- Part No. 1801112AT8 (Model PSA-35) . . . . . Pacific Scientific
- Part No. 1801119AT8 (Model PSA-100). . . . . Pacific Scientific

Fixture, Holding:
- Part No. 1801112AT27 (Model PSA-35). . . . . Pacific Scientific
- Part No. 1801119AT26 (Model PSA-100) . . . . Pacific Scientific

Pliers, Truarc, Part No. 0500 . . . . . Waldes Kohinoor, Inc.
Pliers, Truarc, Part No. S6700 47-16 Austel Place
Long Island City,
NY 11101

ASSEMBLY TOOLS

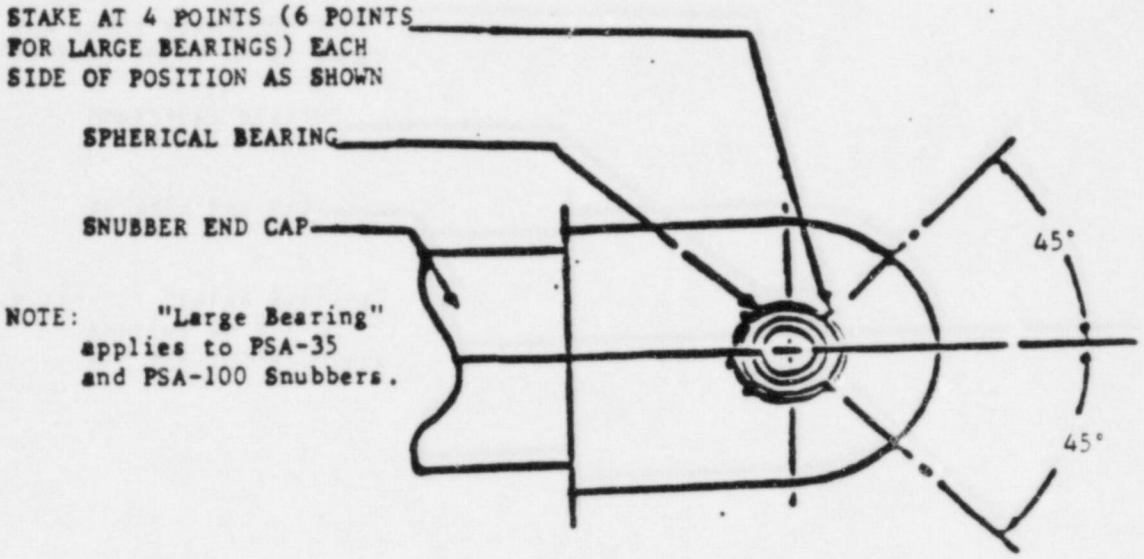
Adaptor, Torque Wrench, Adaptor Nut and Transition Tube:
- Part No. 1801112AT8 (Model PSA-35) . . . . . Pacific Scientific
- Part No. 1801119AT8 (Model PSA-100). . . . . Pacific Scientific

Adaptor, Torque Wrench, End Cap Nut:
- Part No. 1801112AT10 (Model PSA-35). . . . . Pacific Scientific
- Part No. 1801119AT10 (Model PSA-100) . . . . Pacific Scientific

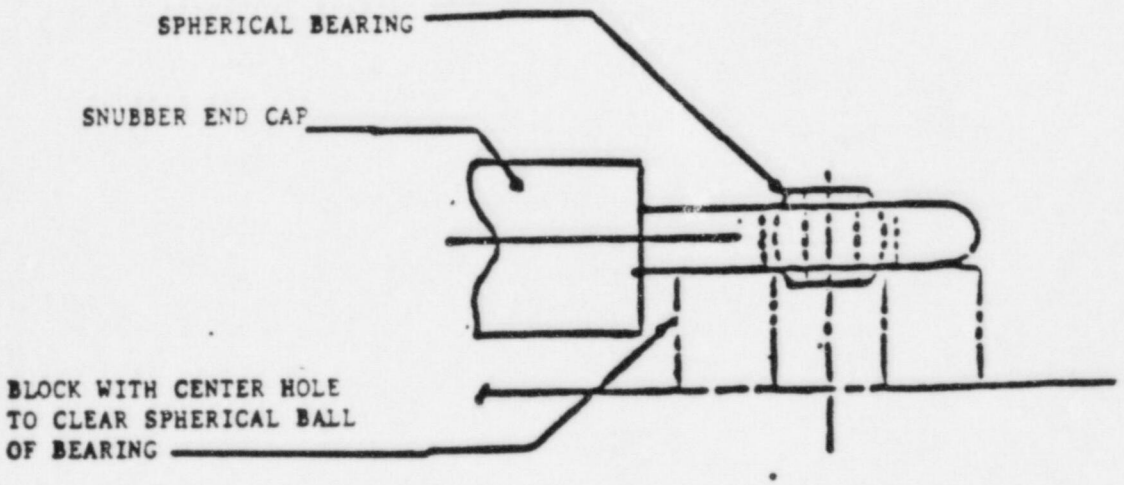
Fixture, Holding:
- Part No. 1801112AT27 (Model PSA-35). . . . . Pacific Scientific
- Part No. 1801119AT26 (Model PSA-100) . . . . Pacific Scientific

Pliers, Truarc, Part No. 0500 . . . . . Waldes Kohinoor Inc.
Pliers, Truarc, Part No. S6700. . . . . 47-16 Austel Place
Long Island City,
NY 11101

PADDLE BEARING STAKING



STAKING FIGURE 1



STAKING FIGURE 2

PSA - 1/4 and PSA - 1/2

MAINTENANCE DATA SHEET

Model No._____ Serial No._____

PIS No._____ PN-21 No._____

Prerequisites Met _____
Signature/Date

Step No.	Description	Data	Acceptance Criteria	M&TE Serial No.	Verified by/ Date
7.1.3.2.a	Outer Tube Insp.	Sat___ *Unsat___	Bore of outer tube shall be round and not interfere with outside diameter of inner tube.	NA	/___
7.1.3.2.b	Torque Carrier/ Shaft Assy Insp.				
	1. Visual	Sat___ *Unsat___	Ball socket must not show evidence of damage or be deformed. No thread form damage allowed.	NA	/___
	2. Dimensional	_____	Run out shall not exceed 0.005 in.	_____	/___
7.1.3.2.c	Rod and Bearing Assy. Insp.				
	1. Bearing Visual	Sat___ *Unsat___	Bearing shall rotate smoothly without binding.	NA	/___
	2. Thread Visual	Sat___ *Unsat___	No evidence of wear allowed.	NA	/___
	3. Dimensional	_____	Shall be concentric within 0.005 inch.	_____	/___

*All discrepancies and/or corrective action shall be specifically described in the Remarks Section.

PSA - 1/4 and PSA - 1/2

MAINTENANCE DATA SHEET

PN-21 No._____

Step No.	Description	Data	Acceptance Criteria	M&TE Serial No.	Verified by/ Date
7.1.3.2.d	Inner Tube Assembly				
	1. Deform. Visual	Sat___ *Unsat___	Surface of inner tube shall be round and not to interfere with inside diameter of outer tube.	NA	/___
	2. Wear Visual	Sat___ *Unsat___	No evidence of wear allowed.	NA	/___
7.1.3.2.e	Nameplate	Sat___ *Unsat___	Nameplate shall be securely attached by drive screws.	NA	/___
7.1.5.30	Jam Nut Torque	_____	Torque Jam Nut to 24 to 26 in. lbs.	_____	/___
7.1.5.34 c.	Rear Bracket or Extention Tube Torque	_____	22 in. pounds (20 - 24 in. lbs.)	_____	/___
7.1.6	Overhaul of Models PSA-1/4 and PSA 1/2	Sat___ *Unsat___	Completed	NA	/___

*All discrepancies and/or corrective action shall be specifically described in the Remarks Section.

PSA - 1/4 and PSA - 1/2

MAINTENANCE DATA SHEET

PN-21 No._____

Test Equipment	Serial No.	Calibration Due Date

REMARKS _____

Completed by:

Name (Print)	Signature	Initials	Employed by	Date

Reviewed by _____ / _____
Foreman / Date

Approved by _____ / _____
Maintenance Engineer or Delegate / Date

PSA - 1, PSA - 3, and PSA - 10

MAINTENANCE DATA SHEET

Model No._____ Serial No._____

PIS No._____ PN-21 No._____

Prerequisites Met _____/_____
Signature/Date

Step No.	Description	Data	Acceptance Criteria	M&TE Serial No.	Verified by/ Date
7.2.3.2.a	Position Indicator Insp.	Sat___ *Unsat___	Bore of position Indicator tube shall be round and not interfere with outside diameter of support support cylinder.	NA	/____
7.2.3.2.b	End Plug Assembly	Sat___ *Unsat___	Bearing shall rotate smoothly without binding. Bearing shall securely installed.	NA	/____
7.2.3.2.c	Support Cyl Assy Operation Check	Sat___ *Unsat___	Telescoping cylinder shall extend and retract through full stroke without hesitation or binding.	NA	/____
7.2.3.2.d	Nameplate	Sat___ *Unsat___	Nameplate shall be securely attached by drive screws (34).	NA	/____
7.2.5.17	End Plug Torque	_____	Torque End Plug (25) to 50 inch pounds (40 - 60 in. lbs.)	_____	/____
7.2.5.20.c	Setscrew (24) Torque	_____	Model Torque in.lbs. PSA-1 10 to 20 in.lbs. PSA-3 15 to 25 in.lbs. PSA-10 15 to 25 in.lbs.	_____	/____

*All discrepancies and/or corrective action shall be specifically described in the Remarks Section.

PSA - 1, PSA - 3, and PSA - 10

MAINTENANCE DATA SHEET

PN-21 No._____

Step No.	Description	Data	Acceptance Criteria	M&TE Serial No.	Verified by/ Date
7.2.5.25. c.	Rear Bracket or Extention Tube Torque		Model Torque in. lbs. PSA-1 40 to 50 in.lbs. PSA-3 110 to 130 in.lbs. PSA-10 420 to 460 in.lbs.		
7.2.6	Overhaul of models PSA-1, 3, and 10	Sat___ *Unsat___	Completed	NA	/

Test Equipment	Serial No.	Calibration Due Date

REMARKS _____

*All discrepancies and/or corrective action shall be specifically described in the Remarks Section.

PSA - 1, PSA - 3, PSA - 10

MAINTENANCE DATA SHEET

PN-21 No._____

Completed by:

Name (Print)	Signature	Initials	Employed by	Date

Reviewed by _____ / _____
Foreman / Date

Approved by _____ / _____
Maintenance Engineer or Delegate / Date

PSA - 35 and PSA - 100

MAINTENANCE DATA SHEET

Model No._____ Serial No._____

PIS No._____ PN-21 No._____

Prerequisites Met _____/_____
Signature/Date

Step No.	Description	Data	Acceptance Criteria	M&TE Serial No.	Verified by/ Date
7.3.3.2.a	Inertia Mass Assy (12) (Clutch spring)	Sat___ *Unsat___	Spring shall be securely installed. There shall be no deformation.	NA	____/____
	(Shell)	Sat___ *Unsat___	No cracks, breaks or gouges shall be evident.	NA	____/____
	(Hub)	Sat___ *Unsat___	Hub shall be securely in place. There shall be no scoring on hub shaft.	NA	____/____
7.3.3.2.b	Torque Carrier Assy (14)	Sat___ *Unsat___	Bearings shall rotate smoothly, Bearings shall be securely installed.	NA	____/____
7.3.3.2.c	End Cap Assy	Sat___ *Unsat___	Bearing shall rotate smoothly without bind. No evidence of elongation or damage. None allowed.	NA	____/____

*All discrepancies and/or corrective action shall be specifically described in the Remarks Section.

PSA - 35 and PSA - 100

MAINTENANCE DATA SHEET

PN-21 No._____

Step No.	Description	Data	Acceptance Criteria	M&TE Serial No.	Verified by/ Date
7.3.3.2.d	Position Indicator Tube (3)	Sat___ *Unsat___	Bore of position indicator tube shall be round and not interfere with outside diameter of support cylinder.	NA	/
7.3.3.2.e	Support Cyl Assy(21)	Sat___ *Unsat___	Telescoping cylinder shall extend and retract through full stroke without hesitation or binding.	NA	/
7.3.3.2.f	Nameplate	Sat___ *Unsat___	Nameplate shall be securely attached by drive screws (22).		/
7.3.5.6.c	End Cap Assy. Torque	___ft. lbs.	150 ft. lbs. (140 - 160)		/
7.3.5.18.d	Adapter Nut (4) or transition tube (5) Torque		150 ft. lbs. (140 to 160)		/
7.3.6	Overhaul of models PSA - 35 or 100	Sat___ *Unsat___	Completed	NA	/

*All discrepancies and/or corrective action shall be specifically described in the Remarks Section.

PSA - 35 and PSA - 100

MAINTENANCE DATA SHEET

PN-21 No._____

Test Equipment	Serial No.	Calibration Due Date

REMARKS _____

Completed by:

Name (Print)	Signature	Initials	Employed by	Date

Reviewed by _____ / _____
Foreman / Date

Approved by _____ / _____
Maintenance Engineer or Delegate / Date

END