This TRW Commercial Steering Systems' service procedure has been written to help you repair commercial vehicles more efficiently. This procedure should not replace your manuals; you should use them together. These materials are intended for use by properly trained, professional mechanics, NOT “Do-it-yourselfers”. You should not try to diagnose or repair steering problems unless you have been trained, and have the right equipment, tools and know-how to perform the work correctly and safely.

Preliminary Inspection

Inspect the following items before beginning this Diagnostic Procedure

Shrouds
Ensure shrouds are secure and all fasteners are in place. Look for cracked or damaged shrouds.

Accessory Switches and Valves
Ensure all switches and valves are properly attached to the column

Wheel Nut
Ensure that the wheel nut is tight and that the threaded steering shaft is not damaged

Column to Cab/Dash mounting points
Visually inspect the mounting points to ensure that all bolts are secure and tightened to the OEM’s specified torque

Slip Shaft Pinch Yokes
Visually inspect slip shaft pinch yokes to ensure that the bolts are secure and the splined shaft is not damaged

Typical Base Column Assembly

1. Base Column
2. Bearing Cap
3. Bearing Cap Bolts (4)
4. Rotating Shaft
5. Bearing Gaskets
6. Telescope Spring
7. E-Clip
8. Retaining Ring
9. Tilt Lock
10. Tilt Lock Pivot Pin
11. Socket Head Shoulder Screw
12. Hex Lock Nut and washer
13. Ground Terminal
14. Ground Wire Assembly
15. Actuator Cam
16. Torsion Spring
17. Retaining Ring
18. Washer
19. Button Head Cap Screw
20. Foot Pedal Assembly
21. Transition Block
22. Foot Pedal Assembly Screws
23. Transition Block Screws
TILT INOPERATIVE

WILL NOT UNLOCK

Remove lower shroud. Inspect cam actuator for damage or play. If not OK refer to COL-121
If OK

If equipped, inspect cable and guide for damage or play. If not OK refer to COL-161
If OK

Inspect tilt lock assembly. If not OK refer to COL-120
If OK

WILL NOT LOCK

Remove lower shroud. Inspect cam actuator for damage or play. If not OK refer to COL-121
If OK

If equipped, inspect cable and guide for damage or play. If not OK refer to COL-161
If OK

Inspect tilt lock assembly. If not OK refer to COL-120
If OK

UNLOCKS steering wheel drops

Replace tilt lock assembly as per COL-120

TELESCOPE INOPERATIVE

WILL NOT UNLOCK

Remove lower shroud. Inspect cam actuator and torsion spring for damage or play. If not OK refer to COL-121
If OK

If equipped, inspect cable and guide for damage or play. If not OK refer to COL-161

WILL NOT LOCK

Remove lower shroud. Inspect cam actuator and torsion spring for damage or play. If not OK refer to COL-121
If OK

If equipped, inspect cable and guide for damage. If not OK refer to COL-161
COLUMN LOOSE
Tilt and Telescope lock and unlock function

Which direction does steering wheel move?

- **Side to Side**
  - Remove upper shrouds
  - Inspect tilt pivot pins for visible looseness relative to (0.2” Max) aluminum casting.
  - If not OK replace base column.

- **All Directions**
  - Remove steering wheel as per manufactures procedure and inspect bearing gasket.
  - If not OK refer to COL-143
  - If OK
    - Inspect upper bearings
      - If not OK refer to COL-119
      - If OK
        - Inspect column bearing cap, bolts and column welds, cracks and separation. Removal of column may be required to inspect.
        - If not OK replace with base column.

- **Fore and Aft (Tilt Direction)**
  - Remove upper and lower shrouds.
  - Inspect Tilt Lock mechanism and connections for looseness (0.2” Max)
  - Replace Tilt Lock assembly as per COL-120
Horn Service

Refer to service parts list. 
To replace contact plunger, refer to TRW Service Procedure COL-139. 
To replace ground terminal, refer to TRW Service Procedure COL-114

Horn Operation

Horn intermittent or not working?

Ground continuity problem

Refer to TRW Service Procedure COL-147

Appearance

Begin

Improper fit or finish?

Tilt / Telescope column?

Tilt Only Column?

Fixed Column?

With Air Valve?

Item #1

Without Air Valve?

Item #2

With Air Valve?

Item #1

Without Air Valve?

Item #2

With Air Valve?

Item #3

Without Air Valve?

Item #4
COLUMNS NOISE & VIBRATION

Begin

- Occurs only when steering?
  - Yes
  - No

  - Occurs when vehicle is in motion & stationary
  - Yes
  - No

  - Occurs only when vehicle is in motion
  - Yes
  - No

  - Excessive intermediate column lash
    - Test #7
      - OK
      - Not OK / Correct

Horn contact needs lubrication
Test #3
- OK
- Not OK / Correct

Gaskets on upper bearings have shifted
Test #5
- OK, less than 1/4"
- Not OK / Correct

Excessive lower bearing vibration
Test #6
- OK
- Not OK / Correct

WHEEL FUNCTIONS

Begin

- Poor electrical connection
  - Test #2
    - OK
    - Not OK / Correct

  - Does the functions work properly?
    - Yes
    - No

  - Does the column use a Smart Wheel?
    - Yes
    - No

  - Horn contact needs lubrication
    - Test #3
      - OK
      - Not OK / Correct

  - Ground discontinuity
    - Test #4
      - OK
      - Not OK / Correct
Test #1  Repair or replace shrouding. Refer to Manufacturers Service Manual.

Test #2  Symptoms include Smart Wheel functions not working properly or are intermittent. If column includes a clockspring, check the Smart Wheel & controller. Check clockspring. Replace parts if necessary. Refer to Manufacturers Service Manual.

Test #3  Symptoms include rubbing or squeaking noise that occurs when the steering wheel is moved. If column does not include a clockspring, remove steering wheel and add dielectric grease to the horn contact as specified in TRW Service Bulletin COL-147. If noise continues, check steering wheel and shroud. Refer to Manufacturers Service Manual.

Test #4  Symptoms include intermittent or non-functioning city horn in standard wheel. Check for ground continuity between shaft where steering wheel mounts and the aluminum die cast housing on the top of the column. If discontinuity is found refer to TRW Service Bulletin COL-114. Check dielectric grease on horn contact as Test #3. Refer to Manufacturers Service Manual.

Test #5  Symptoms include excessive looseness in steering wheel. Apply light force to steering wheel, move side to side (toward driver and passenger door). Relative movement between steering wheel and shroud should be less than 1/4". Check upper bearing gaskets. Gaskets should cover bearing. If gaskets are not in correct location refer to TRW Service Bulletin COL-143. Refer to Manufacturers Service Manual.

Test #6  Symptoms include noise or vibration that can be felt moving or when vehicle is stationary. Problem is engine speed related. Apply side load to intermediate column (I-Shaft). If problem disappears for fixed columns, refer to TRW Service Bulletin COL-145. Refer to Manufacturers Service Manual.

Test #7  Symptoms include driver complaining of feeling "pins and needles" in hands. Problem associated with bumps or holes in the road. Check intermediate column (I-Shaft) for torsional lash in u-joints or slip section. Replace intermediate column if necessary. Refer to Manufacturers Service Manual.